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Rev. 3



LOGIQ e User Guide

R5.2.x, R6.x.x

[Operating Documentation](#)

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Regulatory Requirement

LOGIQ e complies with regulatory requirements of the following European Directive 93/42/EEC concerning medical devices.



This manual is a reference for the LOGIQ e. It applies to all versions of the R5.2.x and R6.x.x software for the LOGIQ e ultrasound system.



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Revision History

Reason for Change

REV	DATE (YYYY/MM/DD)	REASON FOR CHANGE
Rev. 1	2008/09/17	Initial release
Rev. 2	2010/04/08	Update for software update and adding probes
Rev. 3	2010/11/29	Update to add Factory Site and CKD Rating Plate

List of Effected Pages

PAGE NUMBER	REVISION NUMBER	PAGE NUMBER	REVISION NUMBER
Title Page	Rev. 3	Chapter 3	Rev. 3
Revision History	Rev. 3	Chapter 4	Rev. 3
Regulatory Requirements	Rev. 3	Chapter 5	Rev. 3
Table of Contents	Rev. 3	Chapter 6	Rev. 3
Chapter 1	Rev. 3	Chapter 7	Rev. 3
Chapter 2	Rev. 3	Index	Rev. 3

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Regulatory Requirements

Conformance Standards

The following classifications are in accordance with the IEC/EN 60601-1:6.8.1:

- According to 93/42/EEC Medical Device Directive, this is Class IIa Medical Device.
- According to IEC/EN 60601-1,
 - Equipment is Class I, Type B with BF or CF Applied Parts.
 - Docking Cart console is Class I.
- According to CISPR 11,
 - Equipment is Group 1, Class A ISM Equipment.
 - Docking Cart is Group 1, Class A ISM Equipment.
- According to IEC 60529, the footswitch rate is IPx1 (FSU-2001) or IPx8 (MKF 2-MED GP26, FSU-1000) .

This product complies with the regulatory requirement of the following:

- Council Directive 93/42/EEC concerning medical devices: the CE label affixed to the product testifies compliance to the Directive.

The location of the CE marking is shown in the Safety chapter of this manual.

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Conformance Standards (continued)

- International Electrotechnical Commission (IEC).
 - IEC/EN 60601-1 Medical Electrical Equipment, Part 1 General Requirements for Safety.
 - IEC/EN 60601-1-1 Safety requirements for medical electrical systems.
 - IEC/EN 60601-1-2 Electromagnetic compatibility - Requirements and tests.
 - IEC/EN 60601-1-4 Programmable electrical medical systems.
 - IEC/EN 60601-1-6 (Usability), EN 1041 (Information supplied with medical devices).
 - IEC 60601-2-37 Medical electrical equipment. Particular requirements for the safety of ultrasonic medical diagnostic and monitoring equipment.
 - IEC 61157 Declaration of acoustic output parameters.
- International Organization of Standards (ISO)
 - ISO 10993-1 Biological evaluation of medical devices.
- Underwriters' Laboratories, Inc. (UL), an independent testing laboratory.
 - UL 60601-1 Medical Electrical Equipment, Part 1 General Requirements for Safety.
- Canadian Standards Association (CSA).
 - CSA 22.2, 601.1 Medical Electrical Equipment, Part 1 General Requirements for Safety.
- NEMA/NIEM Acoustic Output Display Standard (NEMA UD3).
- Medical Device Good Manufacturing Practice Manual issued by the FDA (Food and Drug Administration, Department of Health, USA).

Certifications

- General Electric Medical Systems is ISO 9001 and ISO 13485 certified.

Original Documentation

- The original document was written in English.

Country Specific Approval

- JAPAN

MHLW Certified Number: 218ABBZX00060000

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Chapter 1

Getting Started

Console Overview, Moving the System, System Start-up, Probes and Beginning an Exam

Console Overview

Application Specific Systems

For information on using the LOGIQ e system optimized for Emergency Department use, refer to Chapter 5.

For information on using the LOGIQ e system optimized for Nerve Block Guidance, refer to Chapter 6.

Indications for Use

The LOGIQ e is intended for use by a qualified physician for ultrasound evaluation. Specific clinical applications and exam types include:

- Fetal/Obstetrics
- Abdominal (including GYN)
- Pediatric
- Small Organ (including breast, testes, thyroid)
- Neonatal Cephalic
- Adult Cephalic
- Cardiac (adult and pediatric)
- Peripheral Vascular
- Intraoperative (abdominal, thoracic and peripheral)
- Thoracic/Pleural (fluid/motion detection)
- Musculo-skeletal Superficial
- Musculo-skeletal Conventional
- Urology (including prostate)
- Transrectal
- Transvaginal
- Transesophageal



This machine should be used in compliance with law. Some jurisdictions restrict certain uses, such as gender determination.

Contraindication

The LOGIQ e ultrasound system is not intended for ophthalmic use or any use causing the acoustic beam to pass through the eye.

Prescription Device



CAUTION: United States law restricts this device to sale or use by, or on the order of a physician.

Important Notices

Do not attempt to install the system alone. General Electric, Affiliate, or Distributor Field Engineers and Application Specialists will install and setup the system. See 'Contact Information' on *page 3-24 for more information*.

NOTICE

This medical equipment is approved, in terms of the prevention of radio wave interference, to be used in hospitals, clinics and other institutions which are environmentally qualified. The use of this equipment in an inappropriate environment may cause some electronic interference to radios and televisions around the equipment.

Ensure that the following is provided for the new system:

- A separate power outlet with a 6 amp circuit breaker for 220-240 VAC or a 10 amp circuit breaker for 100-120 VAC.
- Take precautions to ensure that the console is protected from electromagnetic interference.

Precautions include:

- Operate the console at least 15 feet away from motors, typewriters, elevators, and other sources of strong electromagnetic radiation.
- Operation in an enclosed area (wood, plaster or concrete walls, floors and ceilings) helps prevent electromagnetic interference.
- Special shielding may be required if the console is to be operated in the vicinity of radio broadcast equipment.



To avoid risk of fire, the system power must be supplied from a separate, properly rated outlet.

Under no circumstances should the AC power plug be altered, changed, or adapted to a configuration rated less than specified. Never use an extension cord or adapter plug.

To help assure grounding reliability, connect to a "hospital grade" or "hospital only" grounded power outlet.

Important Notices (continued)

Table 1-1: Example Plug and Outlet Configurations

AC DC Type	Specification	AC DC Type	Specification
	220-240 VAC, 2.5A (China)		220-240 VAC, 2.5A (Switzerland)
	220-240 VAC, 2.5A (India)		220-240 VAC, 2.5A (U.K.)
	220-240 VAC, 2.5A (Argentina)		100-120 VAC, 2.5A (USA)
	220-240 VAC, 2.5A (Europe)		220-240 VAC, 2.5A (Israel)
	100-120 VAC, 2.5A (Japan)		220-240 VAC, 2.5A (Australia)

Console graphics

The following are illustrations of the console:

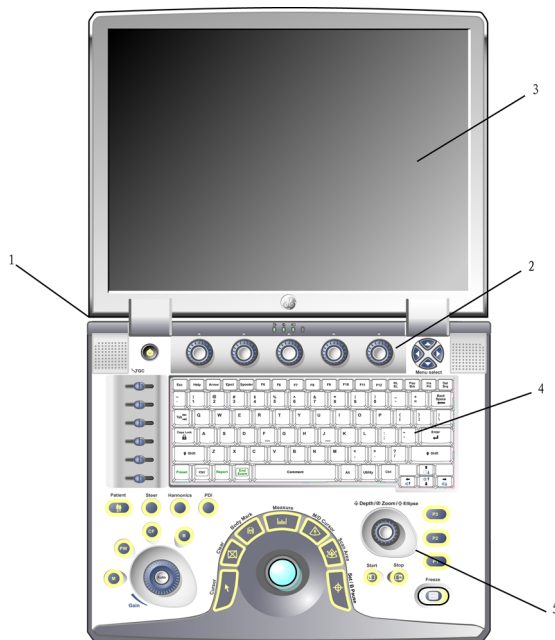


Figure 1-1. LOGIQ e System (opened view)

1. Handle
2. Soft Menu (use same as menu key)
3. LCD
4. Alphanumeric keys
5. Control Panel

Console graphics (continued)



Figure 1-2. LOGIQ e System (side views)



Do not push objects into air vents and openings of LOGIQ e. Doing so can cause fire or electric shock by shorting out interior components.



For compatibility reasons, use only GE approved probes, peripherals or accessories.

DO NOT connect any probes or accessories without approval by GE.

Battery

The lithium ion battery provides power when an AC power source is not available. A battery in the battery bay is standard with the LOGIQ e. Lithium ion batteries last longer than conventional batteries and do not require replacement as often. You can expect one hour of battery life while scanning with a single fully charged battery.

The lithium ion technology used in your system's battery is significantly less hazardous to the environment than the lithium metal technology used in some other batteries (such as watch batteries). Used batteries should not be placed with common household waste products. Contact local authorities for the location of a chemical waste collection program nearest you.

NOTE: *The battery is designed to work with LOGIQ e systems only. Only use the batteries authorized by GE.*



- The battery has a safety device. Do not disassemble or alter the battery.
- Charge the batteries only when the ambient temperature is between 0 and 40 degrees C (32 and 104 degrees F) and discharge the batteries between 0 and 40 degrees C (32 and 104 degrees F).
- Do not short-circuit the battery by directly connecting the negative terminals with metal objects.
- Do not heat the battery or discard it in a fire.
- Do not expose the battery to temperature over 50 degrees C (122 degrees F). Keep it away from fire and other heat sources.
- Do not charge the battery near a heat source, such as a fire or heater.
- **Do not leave the battery in direct sunlight.**
- Do not pierce the battery with a sharp object, hit it, or step on it.
- Do not use a damaged battery.
- Do not solder a battery.
- Do not connect the battery to an electrical power outlet.

Battery (continued)

If the LOGIQ e is not being used on a monthly basis, the battery needs to be removed during the lengthy non-use period.



To avoid the battery bursting, igniting, or fumes from the battery causing equipment damage, observe the following precautions:

- Do not immerse the battery in water or allow it to get wet.
- Do not put the battery into a microwave oven or pressurized container.
- If the battery leaks or emits an odor, remove it from all possible flammable sources.
- If the battery emits an odor or heat, is deformed or discolored, or in a way appears abnormal during use, recharging or storage, immediately remove it and stop using it. If you have any questions about the battery, consult GE or your local representative.
- Short term (less than one month) storage of battery pack:
 - Store the battery in a temperature range between 0 degrees C (32 degrees F) and 50 degrees C (122 degrees F).

Battery (continued)



- Long term (3 months or more) storage of battery pack:
 - Store the battery in a temperature range between -20 degrees C (-4 degrees F) and 45 degrees C (113 degrees F)
 - Upon receipt of the LOGIQ e and before first time usage, it is highly recommended that the customer performs one full discharge/charge cycle.

NOTE: A full discharge/charge cycle means the system is turned on using battery power until the battery loses its charge completely and the system shuts down. Plug the LOGIQ e in until the battery is fully charged as indicated by a green LCD light.

If the battery has not been used for >2 months, the customer is recommended to perform one full discharge/charge cycle. It is also recommended to store the battery in a shady and cool area with FCC (full current capacity).
- One Full Discharge/Charge Cycle Process:
 1. Full discharge of battery to let the LOGIQ e automatically shut down.
 2. Charge the LOGIQ e to 100% FCC (full current capacity).
 3. Discharge of LOGIQ e for complete shut down (takes one hour for discharge).
- When storing packs for more than 6 months, charge the pack at least once during the 6 month timeframe to prevent leakage and deterioration in performance.
- Use only GE recognized batteries.

Battery (continued)

View current battery status

When the system is running, there is a battery icon in the system status bar.

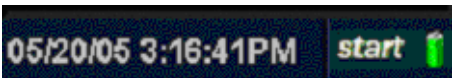


Figure 1-3. Battery icon

When you select this icon, the following appears:

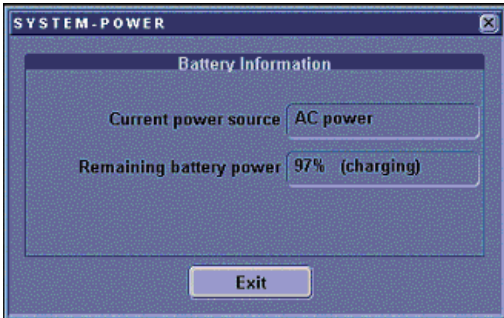


Figure 1-4. Battery Status Message

Current power source—displays the current power source, AC power or Battery.

Total battery power remaining—displays the current power remaining capacity. When there is no battery, “Battery not present” appears. When using a battery, it’s current capacity in percent appears “current capacity (unit: percent)”. If the battery is not in use, it states “current capacity (charging)”.

Warning information—displays warning information when battery power is low. See Figure 1-5.

Battery (continued)

Battery power low warning

If the battery is in use and the battery power is low, a warning message appears to warn the user that the battery power is low and that it needs to be charged.

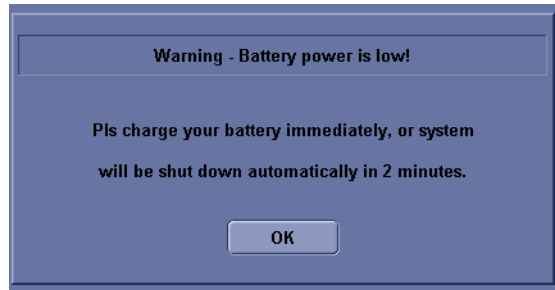


Figure 1-5. Low battery power warning

NOTE: *When the battery power is low and the user cannot charge the battery in time, the system automatically shuts down in 2 minutes. This protects the whole system. You need to save all unsaved data before the system shuts down or you may lose useful information.*

AC Adapter



Do not use an AC adapter without approval by GE.

Be sure that nothing rests on the AC adapter's power cable and that the cable is not located where it can be tripped over or stepped on.

Place the AC adapter in a ventilated area, such as a desk, when you use it to run LOGIQ e. Do not cover the AC adapter with paper or other items that will reduce cooling; do not use the AC adapter inside a carrying case.

To prevent damage to the power cable of the AC adapter, DO NOT pull excessively on the cable; DO NOT make any sharp bends; DO NOT bend the power cable frequently.

Control Panel Map

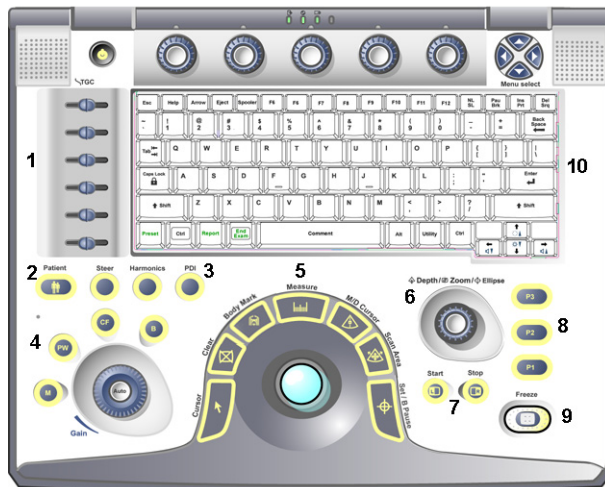


Figure 1-6. Control Panel

- | | |
|---|----------------------------|
| 1. Time Gain Compensation (TGC) | 6. Depth/Zoom/Ellipse |
| 2. New Patient | 7. Start/Stop (L/R) |
| 3. Additional Feature Keys: Steer, Harmonics, PDI | 8. Programmable Print Keys |
| 4. Mode/Gain/Auto keys: M-Mode, Pulsed Wave Doppler (PW) Modes, Color Flow (CF) Mode and B-Mode | 9. Freeze |
| 5. Imaging/Measurement Keys: Cursor, Clear, Bodymark, Measure, M/D Cursor, Scan Area, Set/B Pause | 10. Keyboard |

Top/Sub Menu

The Top/Sub Menu contains exam function and mode/function specific controls.

NOTE: *Different menus are displayed depending on which Top/Sub Menu is selected.*



Figure 1-7. Top/Sub Menu Controls

The Top/Sub Menu contains adjustable knobs associated with it. The adjustable knobs are used to toggle optional functions between up/down selections; the paddle switches are used to access and adjust the menu. The functionality of these controls change, depending upon the currently displayed menu.

Keyboard

The standard alpha-numeric keyboard has some special functions.

Esc	Exit current display screen.
Help (F1 Key)	Access Online help / user manual.
Arrow (F2 Key)	Annotation arrow.
Eject (F3 Key)	Eject media.
Spooler (F4 Key)	Activates DICOM Job Spooler screen.
Reverse (F5 Key)	Reverse.
User Defined Keys (F6 through F11 Keys)	The following functions are available for the F6-F11 keys: TDI, CWD, 3D, LOGIQ View, CrossXBeam, ECG On/Off, Set Home, Text Overlay, Grab Last, Word Delete, Protocol and Video DVR.
Touch Screen Mode On/Off (F12 Key)	Activates/deactivates Touch Screen Mode.
Utility	Enter the Utility function for system configuration and customization.
Preset	Access system Applications and presets.
Report	Access the report page.

Monitor Display

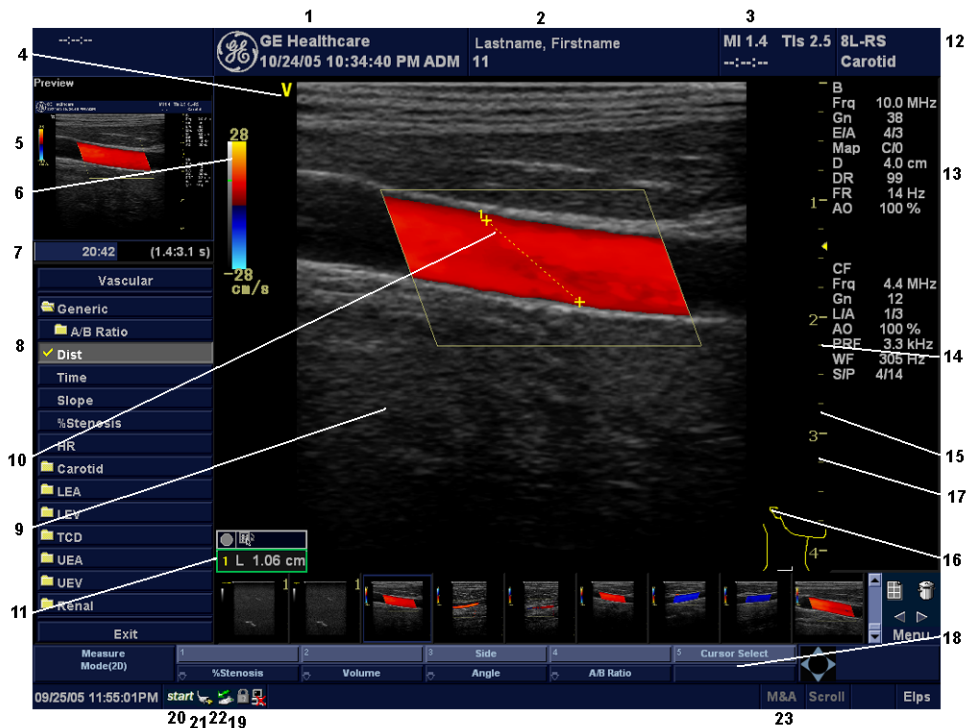


Figure 1-8. Monitor Display Tour

1. Institution/Hospital Name, Date, Time, Operator Identification.
2. Patient Name, Patient Identification.
3. Power Output Readout
4. GE Symbol: Probe Orientation Marker.
5. Image Preview.
6. Gray/Color Bar.
7. Cine Gauge.
8. Measurement Summary Window.
9. Image.
10. Measurement Calipers.
11. Measurement Results Window.
12. Probe Identifier. Exam Preset.
13. Imaging Parameters by Mode.
14. Focal Zone Indicator.
15. TGC.
16. Body Pattern.
17. Depth Scale.
18. Top/Sub Menu.
19. Caps Lock (On or Off)
20. Start Menu Icon
21. Battery Icon
22. Card Icon
23. Trackball Functionality Status: Scroll, M&A (Measurement and Analysis), Position, Size, Scan Area Width and Tilt

Brightness

Adjusting the LCD monitor's brightness is one of the most important factors for proper image quality.

The proper setup displays a complete gray scale. The lowest level of black should just disappear into the background and the highest white should be bright, but not saturated.

To adjust the brightness/volume:

1. On the alphanumeric keyboard,
 - adjust brightness with the **Ctrl + Up/Down** keys;
 - adjust volume with the **Ctrl + Left/Right** keys



Figure 1-9. Brightness and Volume

1. Brightness
2. Volume

NOTE: After readjusting the LCD monitor's Brightness, readjust all preset and peripheral settings.

NOTE: The brightness of the LCD monitor should be set first as it affects the Gain and Dynamic Range settings of your image. Once set, this should not be changed unless the brightness of your scanning environment changes.

Moving the System

Before moving the system

1. Shut down the system. See 'Power Off' on *page 1-19 for more information*.
2. Unplug the power cord (if the system is plugged in).
3. Disconnect all cables from off-board peripheral devices (external printer, etc.) from the console.
To prevent damage to the Power Cord, DO NOT pull excessively on the cord or make sharp bends while wrapping.
4. Store all probes in their original cases or in soft cloth or foam to prevent damage.
5. Store sufficient gel and other essential accessories in the special storage case.

When moving the system

1. Always use the handle to move the system.



The system weighs approximately 4.6 kg (10.1 lbs). To avoid possible injury and equipment damage:

- Do not let the system strike walls or door frame.
- Limit movement to a slow careful walk.

System Start-Up

Power On



Press the **Power On/Off** switch to turn the power on. The circuit breaker must also be in the on position.



Figure 1-10. LED Indicators

1. Indicates hard disk working status. When the LED is flashing, the system is writing or reading from the hard disk.
Color: Green
2. Indicates power status. After pressing the Power On/Off switch, the system power is on and this LED is lit.
Color: Green
3. Indicates battery status. When the battery is charged, the LED is green. When battery power is low, the LED is orange.
Color: Green and Orange
4. The fourth LED does not work on the LOGIQ e.

Power Off

To power off the system:

1. When you shutdown the system, enter the scan screen and lightly press the **Power On/Off** switch at the front of the system once. The System-Exit window is displayed.

NOTE: DO NOT press and hold down the Power On/Off switch to shutdown the system. Instead, lightly press the Power On/Off switch and select Shutdown.

2. Using the **Trackball**, select Shutdown.

The shutdown process takes a few seconds and is completed when the second LED turns from green to off.

NOTE: If the system has not fully shut down in 60 seconds, press and hold down the On/Off switch until the system shuts down.

3. Disconnect the probes.

Clean or disinfect all probes as necessary. Store them in their shipping cases to avoid damage.

4. Disconnect AC adapter mains plug from the power outlet.

NOTE: Disconnect the AC adapter mains plug from the outlet to ensure the system is disconnected from the power source.

Connecting the Probe

Probes can be connected at any time, regardless of whether the console is powered on or off. To ensure that the ports are not active, place the system in the image freeze condition.

To connect a probe:

1. Place the probe's carrying case on a stable surface and open the case.
2. Carefully remove the probe and unwrap the probe cord.
3. DO NOT allow the probe head to hang free. Impact to the probe head could result in irreparable damage. Use the integrated cable management hook to wrap the cord.

Inspect the probe before and after each use for damage or degradation to the housing, strain relief, lens, seal and connector. DO NOT use a transducer which appears damaged until functional and safe performance is verified. A thorough inspection should be conducted during the cleaning process.

4. Align the connector with the probe port and carefully push into place with the cable facing the front of the system.
5. Flip the connector locking lever up.
6. Carefully position the probe cord so it is free to move and is not resting on the floor.
7. When the probe is connected, it is automatically activated.

Connecting the Probe (continued)



Figure 1-11. Probe connection to LOGIQ e



Figure 1-12. Probe connector locking handle



Fault conditions can result in electric shock hazard. Do not touch the surface of probe connectors which are exposed when the probe is removed. Do not touch the patient when connecting or disconnecting a probe.

Cable Handling

Take the following precautions with probe cables:

- Do not bend the cable acutely

Disconnecting the Probe

Probes can be disconnected at any time. However, the probe should not be active when disconnecting the probe.

- Press the connector locking lever down.
- Pull the probe and connector straight out of the probe port.
- Carefully slide the probe and connector away from the probe port and around the right side of the keyboard.
- Ensure the cable is free.
- Be sure that the probe head is clean before placing the probe in its storage box or a wall hanging unit.

Applications

Table 1-2: Probe Indications for Use

Probe Application	4C-RS	E8C-RS	8L-RS	8C-RS	i12L-RS	3S-RS	9L-RS	12L-RS	16L-RS	i739-RS/t739-RS	*6Tc-RS	*6S-RS
Abdomen	X			O		X						
Small Parts			X		O		X	X	X	O		
Obstetrics	X	X										
Gynecology	X	X										
Pediatrics	X		O	X		O	O	O	O			X
Neonatal			O	X			O	O	O			
Urology	X	O										
Cardiac						X					X	X
Endocavity		X										
Transcranial				O		X						
Intraoperative			O	O	X		O	O	O	X	X	
Vascular	O		X	O	X		X	X	X	O		
Biopsy	O	O	O			O	O	O				
Transesophageal											X	
Musculo-skeletal Conventional			X		O		X	X	X	O		
Musculo-skeletal Superficial								X	X			
Thoracic/ Pleural	X					X		X				
X Main Application 0 Accessory Application												
NOTE: 16L-RS is not available in China. *NOTE: LOGIQ e R6.x.x only.												

NOTE: 6Tc-RS probe can not be used with the Docking Cart.

Features

Table 1-3: Probe Features

Probe Application	4C-RS	E8C-RS	8L-RS	8C-RS	112L-RS	3S-RS	9L-RS	12L-RS	16L-RS	1739-RS/1739-RS	*6Tc-RS	*6S-RS
LOGIQ View	X	X	X	X	X	X	X	X	X	X	X	X
Virtual Convex			X		X		X	X	X	X		
Virtual Apex						X					X	X
Easy 3D	X	X	X	X	X	X	X	X		X		X
M Color Flow	X	X	X	X	X	X	X	X	X	X	X	X
Tru Access	X	X	X	X	X	X	X	X	X	X	X	X
Non-Imaging CW						X			X		X	X
CrossXBeam	X	X	X	X	X		X	X	X	X		
ACO	X	X	X	X	X	X	X	X	X	X	X	X
Range Focus	X	X		X		X					X	X
TDI						X					X	X
NOTE: 16L-RS is not available in China. *NOTE: LOGIQ e R6.x.x only												

Beginning an Exam

Scanning a New Patient

When starting a new patient's exam, ensure you do the following:

1. Press **Patient**.
2. Press **New Patient** on the Patient menu.
3. If there are images on the clipboard, a pop-up menu appears. Specify whether you want to store images permanently, delete images, or go to active images.
4. Choose the exam category.
5. Verify the dataflow.

NOTE: *DO NOT use the removable media Data Flows on the New Patient menu.*

6. Fill in patient information.

NOTE: *You can also select a patient from the patient database at the bottom of the Patient menu if the patient has a patient ID.*

Columns drive the ordering of the patients displayed. The column that you select drives the order of the displayed patient database.

7. Select **Register**. Enter Past OB Exam information, if desired.

Scanning a New Patient (continued)

8. Select the probe to start scanning (or select Exit, Esc, Scan, or Freeze).
9. Perform the exam.
10. Store the raw data to the clipboard.

To store the still image, press **Freeze** and run the cineloop using the **Trackball**. Select the frame and press **P1** (or the assigned Printer key).

To store the cineloop, press **Freeze** and run the cineloop using the **Trackball**. Select the start/end frame and run the selected loop. Press **P1** (or the assigned Print key).

11. When you have completed the study, press **End Exam**. The image management screen displays. Select the images (still frame or cineloop) you want to store or select **Select All** to store all images. Select **Permanent Store** to store the images permanently.

Patient Screen

1 2 3 4 5 6 7 8 9

GE Healthcare

Patient ID: 14235132 Last Name: First Name: Middle Name: DOB: Age: Sex: ☐ female ☐ male

Other ID: 134 253 6464

CARD VAS SM P ABD PED OB GYN UR

LMP: ☐ Gravida: Accession #: Exam Description: Ref. Physician: Operator: ADM

BBT: ☐ Para: AB: Ectopic: Fetus #: 1

EDD by LMP: ☐ GA by LMP: ☐

Past Exam Images Clear

Patient View

Search key: Patient ID string: Clear Hide

Patient ID	Last Name	First Name	Birthdate	Sex	Last Exam	Img. size	Other ID
122309-050946	yang	jiaju	12/16/2009 16:50	N	None	123 456 7890	123 456 7891
	lin	chang	12/23/2009 17:10	N	None	123 456 7891	

EZBackup EZMove

Dataflow: Local Archive - Int. HD

Exit Review New Exam Delete Lock Show: All 2/2

Figure 1-13. Patient Screen (Example: Category OB)

Enter Patient Data with the alphanumeric keyboard.

To navigate through the Patient Entry menu, use the **Tab** key or **Trackball** and **Set** to move and fix the cursor.

The Patient Screen details are:

1. Image Management

- Patient—Provides a search and creation of patient. (currently selected)
- Image History—Provides a list of images per exam for the currently selected patient.
- Active Images—Provides preview of the currently selected exam.
- Data Transfer—Provides an interface to handle patient data from a remote device.

Patient Screen (continued)

2. Function Selection

- New Patient–Used to clear patient entry screen in order to input a new patient's data into the database.
- Register–Used to enter new patient information into the database prior to the exam.

NOTE:

If you are using the auto-generate Patient ID feature, do not select Register.

- Details–Select the Detail box to activate/deactivate the exam details. Exam details include Indications, Comments, Admission Number and Exam Description.

The screenshot displays the GE Healthcare Patient Screen interface. On the left is a sidebar with icons for Patient, Data Transfer, Image History, and Active Images. Below these are buttons for New Patient, Register, and Details (which is highlighted). Further down are EZBackup and EZMove buttons, and an Exit button at the bottom. The main window is titled 'GE Healthcare' and contains several sections. The top section is for patient identification, including fields for Patient ID (123454643), Other ID (345 678 9123), Patient Phone #, Address, Last Name (y), First Name (j), Middle Name (j), DOB, Age, and Sex (radio buttons for female and male). Below this is a large text area for Comments. The middle section has tabs for different exam types: ABD, OB, GYN, CARD, VAS, UR, PED, and SM P. The OB tab is selected. The bottom section contains various exam details: LMP (with a calendar icon), Gravida, Accession #, BBT, Para, Exam Description (dropdown), EDD by LMP, AB, Perf. Physician (dropdown), GA by LMP, Ectopic, Ref. Physician (dropdown), Admission #, Fetus # (dropdown), Ref. Phone #, Indications, Operator (dropdown), Comments, and Operator Phone #. At the bottom of the main window are buttons for Past Exam, Images, and Clear.

Figure 1-14. Detail Window

- ### 3. EZBackup–One-step method to backup patient images to an external media.
- EZMove–Move and delete patient images.

Patient Screen (continued)

4. Dataflow Selection—Select the appropriate dataflow.
If you place the cursor on the icon, the pop-up menu displays disk capacity.



WARNING

Ensure you have selected a dataflow. If No Archive is selected, no patient data is saved. A Ø appears next to Dataflow if No Archive is selected.

5. Exit—Used to exit Patient Menu.
6. Patient Information

- Patient ID Number
- Other ID Number

The Other ID is used to add additional information of the patient, such as Citizen ID.

NOTE: *The Other ID field is only available on LOGIQ e R6.x.x.*

NOTE: *To enable/disable the Other ID field, go to Utility --> Connectivity --> Miscellaneous.*

NOTE: *To select Other ID format, go to Utility --> Connectivity --> Miscellaneous.*

NOTE: *The Other ID must be unique; The Other ID must be accordant with the selected format.*

- Patient Name—Last, First and Middle
- DOB (Birthdate)
- Age (automatically calculated when birthdate is input)
- Sex

7. Category Selection

Select from 8 exam application categories: Abdomen, Obstetrics, Gynecology, Cardiology, Vascular, Urology, Small Parts or Pediatrics.

When a category is selected, the measurement and category presets are displayed.

8. Exam Information

Shows the Current/Active Exam information. Information pertinent to the selected exam category appears in the window. All possible information needs to be entered.

- Images—Displays the selected exam's images.
- Clear—Clears existing data.
- Past Exam (only for OB)—Input past exam data (register the patient before using).

Patient Screen (continued)

9. Patient View—Lists the patients in the database.

- Search key—select search item from Patient ID, Last Name, First Name, Birthdate, Sex, Exam Date, Exam Today, Accession Number, Exam Description, Exam Date Before, Exam Date Between, Exam Date After.

NOTE: *If “Exam Date Between” is selected, the Input Dialog displays and you can select the date from the displayed calendar.*

- String—enter appropriate information.

NOTE: *In the Search String, the From and To dates are separated by a “-” (dash) if “Exam Date Between” is used for the Search key.*

- Clear—Clears the entered string.
- Show All—Displays all patients in the database.
- Show XX/XX—Displays the searched (selected) patients (number of patients currently displayed on the list/ number of patients in the database).
- Review—Select Patient/Exam for review.
- Resume Exam—Continues the exam for that patient if you select the last exam of the day.
- New Exam—Creates a new exam on a current patient.
- Delete—Deletes Patient/Exam.

NOTE: *“Delete” is only displayed when you login as Administrator.*

- Hide—Hides the Patient List Section.
- Lock/Unlock—Locks the exam/patient. Prevents move and delete functions.

Exam View—Displays the Exam History of the selected patient.



To avoid patient identification errors, always verify the identification with the patient. Make sure the correct patient identification appears on all screens and hard copy prints.

Patient Screen (continued)



To maintain optimum performance and to safeguard patient data, keep the total number of patients in the database below 1,000.

To reduce the total number of patients in the database, perform the following procedure.

1. Prepare the unformatted CD-R, DVD-R or USB HDD before EZBackup.

NOTE: *Formatted CD-R or DVD-R cannot be used for EZBackup.*

2. Backup all patient data by EZBackup. Before beginning EZBackup, set the "Backup Files Older Than in Days" to "0" on the Utility -> System -> Backup/Restore -> EZBackup/Move screen to backup all data.
3. Go to the patient screen, select the patients/exams to delete so the remaining number is less than 1,000. Select "Delete" to delete the selected data.

NOTE: *Removing image data with the "EZMove" function does not reduce the patient number in the database.*

NOTE: *For each media to do EZBackup or Move, select a proper capacity for the "Media capacity for estimate" preset under Utility ->System ->Backup/Restore. For example, you can select 700M for a CD or 4700M for a DVD.*

Chapter 2

Performing an Exam

Optimizing the Image and Measurement and Analysis

Optimizing the Image

B-Mode Controls

Table 2-1: B-Mode Controls

Control	Possible Bioeffect	Description/Benefit
Depth	Yes	Depth controls the distance over which the B-Mode images anatomy. To visualize deeper structures, increase the depth. If there is a large part of the display which is unused at the bottom, decrease the depth.
Gain	No	B-Mode Gain increases or decreases the amount of echo information displayed in an image. It may have the effect of brightening or darkening the image if sufficient echo information is generated.
Focus	Yes	Increases the number of focal zones or moves the focal zone(s) so that you can tighten up the beam for a specific area. A graphic caret corresponding to the focal zone position(s) appears on the right edge of the image.
Auto Optimize	No	Auto lets you optimize the image based upon the actual B-Mode image data (Auto Tissue Optimize, ATO). The preset levels (Low, Medium, and High) allow you to pick a preference for the contrast enhancement in the resulting image. Low does the least amount of contrast enhancement, high does the most. Auto is available in single or multi image, on live, frozen or CINE images (in B-Mode only), and while in zoom, in Color Flow Mode, and in Spectral Doppler. Auto in Color Flow Mode automatically adjusts the overall color gain. Auto in PW Doppler Mode optimizes the spectral data. Auto adjusts the Velocity Scale/PRF (live image only), baseline shift, dynamic range, and invert (if preset). Upon deactivation, the spectrum is still optimized. The benefit of Auto can be found in reduced optimization time and a more consistent and accurate optimization process.
M/D Cursor	No	Displays the Doppler Mode cursor on the B-Mode image.
Harmonics	Yes	Harmonics enhances near field resolution for improved small parts imaging as well as far field penetration.
Frequency	Yes	Multi Frequency mode lets you downshift to the probe's next lower frequency or shift up to a higher frequency.

Table 2-1: B-Mode Controls (Continued)

Control	Possible Bioeffect	Description/Benefit
CrossXBeam	Yes	CrossXBeam is the process of combining three or more frames from different steering angles into a single frame. The combined single image has the benefits of reduced speckle noise, reduced clutter, and continuity of specular reflectors. Therefore, this technique can improve contrast resolution with increased conspicuity of low contrast lesions, better detection of calcifications, biopsy needle visualization, and cystic boundary definition.
TGC	No	TGC amplifies returning signals to correct for the attenuation caused by tissues at increasing depths. TGC slide pots are spaced proportionately to the depth. The area each pot amplifies varies as well. A TGC curve may appear on the display (if preset), matching the controls that you have set (except during zoom). You can choose to deactivate the TGC curve on the image.
Scan Area	Yes	You can widen or narrow the size of the sector angle to maximize the image's region of interest (ROI).
Tilt	Yes	You can steer the sector angle to get more information without moving the probe while in B-Mode, M-Mode, Doppler Mode, and Color Flow Mode. Tilt is not available on Linear probes.
Angle Steer	Yes	You can steer the PW Doppler or Color Flow sector angle to get more information without moving the probe.
Reverse	No	Flips the image 180 degrees left/right.
Dynamic Range (Compression)	No	Dynamic Range controls how echo intensities are converted to shades of gray, thereby increasing the adjustable range of contrast. The Dynamic Range control name changes to Compression on frozen images.
Line Density	Yes	Optimizes B-Mode frame rate or spatial resolution for the best possible image.
Map	No	The system supplies B, M, and Doppler Mode system maps.
Frame Average	No	Temporal filter that averages frames together, thereby using more pixels to make up one image. This has the effect of presenting a smoother, softer image.
Colorize	No	Colorize is the colorization of a conventional B-Mode image or Doppler Spectrum to enhance the user's ability to discern B, M, and Doppler Mode intensity valuations. Colorize is NOT a Doppler Mode. Colorizes the gray scale image to enhance the eye's discrimination capability. Spectrum Colorize colorizes the spectrum as a function of power using the inverse of the Colorize map for the signal intensity in each Doppler line. Colorize enhances the visibility of the spectrum's characteristics and enhances your ability to identify spectral broadening and the edge contours of the spectrum used to define the peak frequency/velocity.

Table 2-1: B-Mode Controls (Continued)

Control	Possible Bioeffect	Description/Benefit
Edge Enhance	No	Edge Enhance brings out subtle tissue differences and boundaries by enhancing the gray scale differences corresponding to the edges of structures. Adjustments to M-Mode's edge enhancement affects the M-Mode only.
Rotation	No	Flips the image 180 degrees up/down. CAUTION: When reading an rotated image, be careful to observe the probe orientation to avoid possible confusion over scan direction or left/right image reversal.
Virtual Convex	Yes	On Linear probes, Virtual Convex provides a larger field of view in the far field.
SRI HD	No	SRI HD (Speckle Reduction Imaging High Definition) is an adaptive algorithm to reduce the unwanted effects of speckle in the ultrasound image.
B Softener	No	Affects the amount of lateral smoothing. It's similar to dynamic range by softening the appearance/edges of the image.
Virtual Apex	Yes	On sector probes, Virtual Apex provides a larger field of view in the far field.
Range Focus	Yes	Improves the near/mid field image quality, borders/interfaces, increases contrast and detail resolution across the image and allows for less filling in the vessels.
CenterLine	No	The centerline of the image, for 12L-RS only.
B Steer+	Yes	Slants the B-Mode or Color Flow linear image left/right to get more information without moving the probe. The angsteer function only applies to linear probes.
Rejection	No	Selects a level below which echoes will not be amplified (an echo must have a certain minimum amplitude before it will be processed).

M-Mode Controls

Table 2-2: M-Mode Controls

Control	Possible Bioeffect	Description/Benefit
Sweep Speed	Yes	Changes the speed at which the timeline is swept. Available in M-Mode, Doppler Mode and M Color Flow Mode.
Anatomical M-Mode	Yes	Anatomical M-Mode gives you the ability to manipulate the cursor at different angles and positions. The M-Mode display changes according to the position of the cursor.

Color Flow Mode Controls

Table 2-3: Color Flow Mode Controls

Control	Possible Bioeffect	Description/Benefit
Gain	No	Gain amplifies the overall strength of echoes processed in the Color Flow window or spectral Doppler timeline.
PRF (Pulse Repetition Frequency)	Yes	Increases/decreases the PRF on the color bar.
Wall Filter	No	Filters out low flow velocity signals. It helps get rid of motion artifacts caused from breathing and other patient motion.
Color Scan Area	Yes	Scan Area sizes and positions the color window.
Invert (Color Invert)	No	Lets you view blood flow from a different perspective, e.g., red away (negative velocities) and blue toward (positive velocities). You can invert a real-time or frozen image. <i>NOTE: Invert reverses the color map, NOT the color PRF.</i>
Baseline	No	Changes the Color Flow or Doppler spectrum baseline to accommodate higher velocity blood flow. Minimizes aliasing by displaying a greater range of forward flow with respect to reverse flow, or vice versa. Baseline adjusts the alias point. The default baseline is at the midpoint of the color display and at the midpoint of the color bar reference display.
Angle Steer	Yes	You can slant the ROI of the Color Flow linear image left or right to get more information without moving the probe. The Angle Steer function only applies to linear probes.
Color Flow Line Density	Yes	Optimizes the Color Flow frame rate or spatial resolution for the best possible color image.
Map	No	Allows you to select a specific color map. After you have made your selection, the color bar displays the resultant map.
Threshold	No	Threshold assigns the gray scale level at which color information stops.
Frame Average	No	Averages color frames.
Transparency Map	No	Brings out the tissue behind the color map.
Spatial Filter	No	Smooths out the color, makes it look less pixely.

Table 2-3: Color Flow Mode Controls (Continued)

Control	Possible Bioeffect	Description/Benefit
Packet Size	Yes	Controls the number of samples gathered for a single color flow vector.
Power Doppler Imaging (PDI)	No	Power Doppler Imaging (PDI) is a color flow mapping technique used to map the strength of the Doppler signal coming from the tissue rather than the frequency shift of the signal. Using this technique, the ultrasound system plots color flow based on the number of reflectors that are moving, regardless of their velocity. PDI does not map velocity, therefore it is not subject to aliasing.
M Color Flow Mode	Yes	M Color Flow is used for fetal cardiac applications. Color Flow overlays color on the M-Mode image using velocity and variance color maps. The Color Flow wedge overlays the B-Mode image and M-Mode timeline. The Color Flow maps available in M-Mode are the same as in Color Flow Mode. The size and position of the Color Flow window in B-Mode determines the size and position of the Color Flow window in M-Mode. All M-Mode measurements are available with M Color Flow active: depth, distance along a straight line, % stenosis, volume, trace, circumference, enclosed area, distance, time, slope, and heart rate.

Doppler Mode Controls

Table 2-4: Doppler Mode Controls

Control	Possible Bioeffect	Description/Benefit
B Pause	Yes	Toggles between simultaneous and update presentation while viewing the timeline.
Doppler sample volume gate position (Trackball)	Yes	Moves the sample volume gate on the B-Mode's Doppler Mode cursor. The gate is positioned over a specific position within the vessel.
Doppler sample volume length	Yes	Sizes the sample volume gate.
PRF	Yes	Adjusts the velocity scale to accommodate faster/slower blood flow velocities. Velocity scale determines pulse repetition frequency. If the sample volume gate range exceeds single gate PRF capability, the system automatically switches to high PRF mode. Multiple gates appear, and HPRF is indicated on the display.
Angle Correct	No	Estimates the flow velocity in a direction at an angle to the Doppler vector by computing the angle between the Doppler vector and the flow to be measured. <i>NOTE: When the Doppler Mode Cursor and angle correct indicator are aligned (the angle is 0), you cannot see the angle correct indicator.</i>
Quick Angle	No	Quickly adjusts the angle by 60 degrees.
Wall Filter	No	Insulates the Doppler signal from excessive noise caused from vessel movement.
Baseline	No	Adjusts the baseline to accommodate faster or slower blood flows to eliminate aliasing.
M/D Cursor	No	Displays the Doppler Mode cursor on the B-Mode image.
Audio Volume	No	Controls audio output.
Invert	No	Vertically inverts the spectral trace without affecting the baseline position.
Dynamic Range	No	Dynamic range controls how echo intensities are converted to shades of gray, thereby increasing the range of contrast you can adjust.
Spectral Trace (Trace Method)	No	Traces the average mean and peak velocities in realtime or frozen images.
Trace Sensitivity	No	Adjust the trace to follow the waveform for signal strength.
Cycles to Average	No	The average value over a number of cycles (from 1-5).
Trace Direction	No	Specifies trace direction.

Table 2-4: Doppler Mode Controls (Continued)

Control	Possible Bioeffect	Description/Benefit
Full Timeline	No	Expands display to full timeline display.
Display Format	No	Changes the horizontal/vertical layout between B-Mode and M-Mode, or timeline only.
Duplex/Triplex	No	Duplex allows two modes to be active at the same time (B+PW or B+CW or B+CF); Triplex allows three modes to be active at the same time (C+PW+CF or B+CW+CF). When Duplex/Triplex is OFF, either the image or timeline is active. B-Pause then switches the active side between image and the timeline. With Duplex/Triplex active, M/D Cursor functions the same as the Duplex/Triplex control by cycling Duplex/Triplex on/off. B-Pause pauses the image while keeping the CW / PW timeline active.
Time Resolution	No	Adjusts image appearance so that if you select a lower setting, the image appears smoother; if you select a higher setting, the image appears sharper.
Spectral Average	No	Averages the spectrum in a vertical direction and timeline direction.
Modify Auto Calcs	No	Activates the menu to select which calculations are automatically calculated.
Auto Calcs	No	Activates the calculation automatically which you select in the Modify Auto Calculation when the system is in a state of freeze or live.
Continuous Wave Doppler (CWD)	No	Allows examination of blood flow data all along the Doppler Mode cursor rather than from any specific depth. Gather samples along the entire Doppler beam for rapid scanning of the heart. Range gated CW allows information to be gathered at higher velocities.

Other Controls

Zoom

Zoom is used to magnify a zoom region of interest (ROI). The system adjusts all imaging parameters accordingly. You can also zoom frozen images.



Acoustic
Output
Hazard

Observe the output display for possible effects.

To zoom an image, adjust Zoom. A reference image appears in the upper, left-hand section of the display.

To exit zoom, adjust Zoom until the reference zoom image is removed or press **B-Mode**.

Freezing an image

To freeze an image,

1. Press Freeze. The key backlights.

If you are in a mixed mode, both screen formats stop immediately. Deactivating Freeze restarts both modes and places a black bar on the trace to indicate the time discontinuity.

To reactivate the image,

1. Press Freeze again.

NOTE: *Deactivating Freeze erases all measurements and calculations from the display (but not from the worksheet).*

Use the Trackball to start CINE after pressing Freeze.

Activating CINE

To activate CINE,

1. Press Freeze.
2. Move the Trackball.

Body Patterns

To activate body patterns, press the **Body Mark** control.

Select the desired body pattern with the Top/Sub Menu controls. The selected body pattern is displayed on the monitor.

Press the **Move Pattern** control on the Top/Sub Menu to reposition the body pattern with the **Trackball** and **Set** controls.

A probe mark is associated with the body patterns and illustrates the probe position on the body pattern. This marker can be placed with the **Trackball** and rotated with the **Rotate Pattern** control.

The probe mark type is selectable by rotating the **Probe Type** control on the Top/Sub Menu. There are different choices available with one being a blank selection.

To select the active side in dual B-Mode, use the **Active Side** rotary control at the bottom of the Top/Sub Menu.

Press **Clear** to erase the body pattern. The pattern is erased and the system exits the body pattern mode.

Annotating an Image

Pressing the **Comment** key or any keys on the alphanumeric keyboard initiates the comment mode. This assigns the trackball function to controlling the cursor and displays the comment library on the Top/Sub Menu menu.

In comment mode, text can be added by using the comment library or by typing from the alphanumeric keyboard.

After activating the comment mode, a vertical bar type cursor appears on the screen. Use the **Trackball** to move the cursor.

To delete all comments, press the **Clear** key twice immediately after entering the comment mode.

Arrow pointers can be used by activating the **F2 (Arrow)** key on the keyboard. When the pointer comes up, it is a GREEN color, indicating it is active and can be moved.

Measurement and Analysis

B-Mode Measurements

Two basic measurements can be made in B-Mode.

- Distance
- Circumference and Area
 - Ellipse Method
 - Trace Method
 - Spline Method

*NOTE: The following instructions assume that you first scan the patient and then press **Freeze**.*

Distance measurement

To make a distance measurement:

1. Press **Measure** once; an active caliper displays.
2. To position the active caliper at the start point, move the **Trackball**.
3. To fix the start point, press **Set**.
The system fixes the first caliper and displays a second active caliper.
4. To position the second active caliper at the end point, move the **Trackball**.
A dotted line connects the measurement points, if preset accordingly.
5. To complete the measurement, press **Set**.
The system displays the distance value in the Results Window.

The following hints can help you to perform distance measurements:



HINTS

- **Before** you complete a measurement:
 - To toggle between active calipers, press **Measure**.
 - To erase the second caliper and the current data measured and start the measurement again, press **Clear** once.
- **After** you complete the measurement:
 - To rotate through and activate previously fixed calipers, adjust **Cursor Select**.
 - To erase all data that has been measured to this point, but not data entered onto worksheets, press **Clear**.

Circumference and area (ellipse) measurement

You can use an ellipse to measure circumference and area. To measure with an ellipse:

1. Press **Measure** once; an active caliper displays.
2. To position the active caliper, move the **Trackball**.
3. To fix the start point, press **Set**. The system fixes the first caliper and displays a second active caliper.
4. To position the second caliper, move the **Trackball**.
5. Adjust the **Ellipse** control; an ellipse with an initial circle shape displays.
6. To position the ellipse and to size the measured axes (move the calipers), move the **Trackball**.
7. To increase the size, adjust the **Ellipse** control in a clockwise direction. To decrease the size, adjust the **Ellipse** control in a counterclockwise direction.
8. To toggle between active calipers, press **Measure**.
9. To complete the measurement, press **Set**. The system displays the circumference and area in the Results Window.



HINTS

Before you complete the ellipse measurement:

- To erase the ellipse and the current data measured, press **Clear** once. The original caliper is displayed to restart the measurement.
- To exit the measurement function without completing the measurement, press **Clear** a second time.

Circumference and area (trace) measurement

- Trace** To trace the circumference of a portion of the anatomy and calculate its area:
1. Press **Measure** until a trace caliper displays.
 2. To position the trace caliper at the start point, move the **Trackball**.
 3. To fix the trace start point, press **Set**. The trace caliper changes to an active caliper.
 4. To trace the measurement area, move the **Trackball** around the anatomy. A dotted line shows the traced area.
 5. To complete the measurement, press **Set**. The system displays the circumference and the area in the Results Window.

- Open Trace** To trace the circumference of a portion of the anatomy and calculate its length:

NOTE:

- For open trace, Area (A) is not displayed in the result window.*
1. Press **Measure** until a trace caliper displays.
 2. To position the trace caliper at the start point, move the **Trackball**.
 3. To fix the trace start point, press **Set**. The trace caliper changes to an active caliper.
 4. To trace the measurement area, move the **Trackball** around the anatomy. A dotted line shows the traced area.
 5. To complete the measurement, press **Set**. The system displays the circumference and the length in the Results Window.



HINTS

Before you complete the trace measurement:

- To erase the line (bit by bit) back from its current point, move the **Trackball** or adjust the **Ellipse** control counterclockwise.
- To erase the dotted line but not the trace caliper, press **Clear** once.
- To clear the trace caliper and the current data measured, press **Clear** twice.

Circumference and area (spline trace) measurement

To trace the circumference of a portion of the anatomy and calculate its area:

1. Press **Measure** until a trace caliper displays.
2. To position the first caliper at the start point, move the **Trackball**.
3. To fix the trace start point, press **Set**. The first caliper turns yellow. The second caliper appears at the same position as the first caliper and is green.

NOTE: *When pressing the **Clear** key once, the second caliper disappears and the first caliper is activated.*

*If **Clear** is pressed again, the first caliper disappears and the Spline trace is cancelled.*

4. To position the second caliper, move the **Trackball** and press **Set**. The third caliper appears at the same position.

NOTE: *The **Clear** key functionality is the same as noted in the previous step.*

The spline trace requires at least three points to draw the trace. Continue setting the points of the trace until the desired points are set.

5. Press **Set** twice to finish this measurement.

If **Clear** is pressed twice when more than 3 points exist on the trace, all points are removed and the first caliper again displays.

NOTE: *Spline trace is not available through the factory default. The system defaults to trace. To enable spline trace, modify the Measure Key Sequence preset found in Utility -> Measure -> Advanced preset menu.*

Circumference and area (spline trace) measurement (continued)

Edit the spline trace

1. Select **Cursor Select**. The spline trace changes to green and all points appear on the trace as yellow.

A pick-caliper appears on the center of the image and the message "Edit spline trace" displays at the bottom of the screen.

NOTE: *The pick-caliper is used to select and move the trace points.*

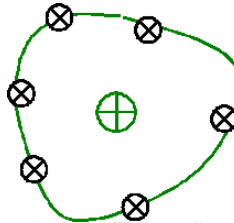


Figure 2-1. Edit spline trace

Select **Cursor Select** again. The trace is deactivated (changes to yellow) and all points, including the pick-caliper, are removed.

If the previous/next fixed caliper exists on the image, it is activated.

NOTE: *Pressing **Clear** at this time removes all points and the trace graphic.*

2. Move the pick-caliper to the desired point and press **Set**. The point is activated and turns green.
3. Move the point to the desired position and press **Set**. The point is fixed and turns yellow. The pick-caliper appears on the center of the image.

NOTE: *The spline trace is updated at run time.*

NOTE: *To remove a point, press **Clear** while moving the point. The trace turns green and the remaining points continue to be shown as yellow. If there are less than three points, the spline trace is removed.*

4. Press **Set** again. All points are removed from the trace and the trace is shown as yellow.

Doppler Mode Measurements

Four basic measurements can be made in Doppler Mode.

- Velocity
- TAMAX and TAMEAN (Manual or Auto Trace)
- Two Velocities with the Time Interval and Acceleration between them
- Time Interval

NOTE: *The following instructions assume that you do the following:*

1. In the B-Mode part of the display, scan the anatomy you want to measure.
2. Go to the Doppler Mode part of the display.
3. Press **Freeze**.

Velocity

To measure velocity:

1. Press **Measure**; an active caliper with a vertical dotted line displays.
2. To position the caliper at the desired measurement point, move the **Trackball**.
3. To complete the measurement, press **Set**. The system displays the velocity measurement in the Results Window.

TAMAX and TAMEAN

Manual Trace The value measured depends upon the Vol Flow Method preset. The two selections available are: Peak (TAMAX) and Mean (TAMEAN).

To do a manual trace of TAMAX or TAMEAN:

1. Press **Measure** twice; a trace caliper displays.
2. To position the caliper at the trace start point, move the **Trackball**.
3. To fix the start point, press **Set**.
4. To trace the maximum values of the desired portion of the spectrum, move the **Trackball**.

*NOTE: To edit the trace line, move the **Trackball**.*

5. To complete the measurement, press **Set**. The system displays the measurement values in the Results Window.

Auto Trace The value measured depends upon the Vol Flow Method preset. The selection available is the Peak (TAMAX).

To auto trace TAMAX:

1. Press **Measure** twice; an active caliper with a vertical dotted line displays.
2. To position the caliper at the trace start point in the Doppler spectrum, move the **Trackball**.
3. To fix the start point, press **Set**.
4. To position the vertical caliper at the end point, move the **Trackball**.
5. To complete the measurement, press **Set**. The system automatically fixes both calipers and traces the maximum value between the two points. The system displays this value in the Results Window.

NOTE: When you set the Auto Trace for Both (above and below), the system picks up the maximum power of the signal, NOT the maximum velocity. If the maximum velocity is not the maximum power, the system may not trace accurately. If you want to use maximum velocity, select either Above or Below.

- Edit Trace** Auto Trace can be edited after taking an Auto Trace measurement.
1. After taking an Auto Trace measurement, select the measurement result on the result window. The Edit Trace (Edit Peak or Edit Mean) menu window appears.
NOTE: If the system cannot take the trace data correctly from the image, Edit Trace does not work.
 2. Select Edit Trace. The first caliper (manual trace caliper) appears on the center of the image. Use the **Trackball** to move the caliper on the trace line to the start point.
*NOTE: To cancel Edit Trace at this time, press **Clear** or **Freeze**.*
 3. Press **Set** to fix the first caliper. The second caliper appears. Edit the trace manually using the second caliper. The Ellipse control is used to edit the trace.
*NOTE: When pressing the **Clear** key once at this time, the second caliper disappears and the first caliper appears in the center of the image.*
*NOTE: If you press **Freeze** at this time, the caliper is automatically fixed and the result window updates.*
 4. Press **Set** to fix the second caliper. The trace and the result window update. The trace data (TAMAX and TAMEAN) are updated, though the other points (e.g. PS, ED) are not updated by trace. The points can be edited with **Cursor Select**.
NOTE: While in Edit Trace, Cursor Select is disabled.
 5. Repeat Edit Trace as needed.

Velocity, Time Interval and Acceleration

To measure two velocity values, the time interval (ms), and acceleration (m/s^2):

1. Press **Measure** three times; an active caliper with vertical and horizontal dotted lines displays.
2. To position the caliper at the start point, move the **Trackball**.
3. To fix the start point, press **Set**. The system fixes the first caliper and displays a second active caliper.
4. To position the second caliper at the end point, move the **Trackball**.
5. To complete the measurement, press **Set**. The system displays the two peak end point velocities, the time interval, and the acceleration in the Results Window.

Time interval

To measure a horizontal time interval:

1. Press **Measure** four times; an active caliper with a vertical dotted line displays.
2. To position the active caliper at the start point, move the **Trackball**.
3. To fix the start point, press **Set**. The system fixes the first caliper and displays a second active caliper.
4. To position the second caliper at the end point, move the **Trackball**.
5. To complete the measurement, press **Set**. The system displays the time interval between the two calipers in the Results Window.

M-Mode Measurements

Basic measurements that can be taken in the M-Mode portion of the display are:

- Tissue Depth (Distance)
- Time Interval
- Time Interval and Velocity

NOTE: The following instructions assume that you do the following:

1. In the B-Mode part of the display, scan the anatomy you want to measure.
2. Go to the M-Mode part of the display.
3. Press **Freeze**.

Tissue depth

Tissue depth measurement in M-Mode functions the same as distance measurement in B-Mode. It measures the vertical distance between calipers.

1. Press Measure once; an active caliper with a vertical and horizontal dotted line displays.
2. To position the active caliper at the most anterior point you want to measure, move the Trackball.
3. To fix the start point, press Set.
The system fixes the first caliper and displays a second active caliper.
4. To position the second caliper at the most posterior point you want to measure, move the Trackball.
5. To complete the measurement, press **Set**.

The system displays the vertical distance between the two points in the Results Window.

Time interval

To measure a horizontal time interval and velocity:

1. Press **Measure** twice; an active caliper with a vertical dotted line displays.
2. To position the caliper at the start point, move the **Trackball**.
3. To fix the first caliper, press **Set**. The system fixes the first caliper and displays a second active caliper.
4. To position the second caliper at the end point, move the **Trackball**.
5. To complete the measurement, press **Set**. The system displays the time interval between the two calipers in the Results Window.

Time interval and Velocity

To measure time and velocity between two points:

1. Press Measure three times; an active caliper with a vertical and horizontal dotted line displays.
2. To position the active caliper at the start point, move the Trackball.
3. To fix the start point, press Set.
The system fixes the first caliper and displays a second active caliper.
4. To position the second caliper at the end point, move the Trackball.
5. To complete the measurement, press Set.
The system displays time(s) and slope between the two points in the Results Window.

Viewing and Editing Worksheets

NOTE: Worksheets are not saved if the system crashes.

As you complete measurements, the system puts measurement data in the appropriate worksheets.

To view a worksheet

To view a worksheet, select **Worksheet** on the Top/Sub Menu.

The system displays the worksheet for the current study.

To view a different worksheet, select the worksheet key for the desired worksheet.

GE Healthcare		10/14/06 2:53:17 PM		ADM	Pt ID	GA(EDD)=39w3d	--:--:--	
Origin	EDD	LMP		BBT		GA	39w3d	EDD(OPE) 10/18/2006
Fetus A/1			CUA	16w2d+/- 1w0d				EDD(CUA) 03/29/2007
FetusPos		PLAC		Ref.Physician				Page 1/1
B Mode Measurements								
BPD(Hadlock)	☒	3.10 cm	3.23	2.97		Avg.	15w5d	14w4d-17w0d
HC(Hadlock)	☒	11.43 cm	12.93	9.92		Avg.	15w4d	14w3d-16w5d
OFD(HC)		4.13 cm	4.91	3.35		Avg.		
AC(Hadlock)	☒	10.49 cm	10.49			Avg.	16w3d	14w5d-18w1d
FL(Hadlock)	☒	2.25 cm	2.25			Avg.	16w5d	15w3d-18w1d
2D Calculations								
EFW(AC,BPD,FL,HC)		157.70g+/-23.66g		(6oz)				
EFW(Hadlock)-GP		<3%						
CI(Hadlock)		75.01 (70.00-86.00)	FL/AC(Hadlock)	21.47 (-)				
FL/BPD(Hohler)		72.69 (-)	FL/HC(Hadlock)	→ 19.71 (13.67-16.81)				
HC/AC(Campbell)		1.09 (1.06-1.33)						

Figure 2-2. OB B-Mode Worksheet

To return to scanning, do one of the following:

- Select **Worksheet**.
- Press **Esc**.

To view a worksheet (continued)

To view worksheet data for a particular mode, select the key for that mode. To view a worksheet with data for more than one mode, select ***Expand***. When Expand is selected, it defaults to view all measurements, noted by mode, on the worksheet.

If a worksheet has more data on a second page, to view the next page, adjust the **Page Change** control.

To edit a worksheet

To change data on a worksheet:

1. To position the cursor at the field you want to change, move the **Trackball**. The field is highlighted.
2. Press **Set**.
3. Type the new data in the field. The new data is displayed in blue to indicate that it was manually entered.

To delete or exclude data on a worksheet:

1. To position the cursor at the field you want to delete or exclude, move the **Trackball**. The field is highlighted.
2. Do one of the following:
 - To delete the field, select **Delete Value**.
 - To exclude the field, select **Exclude Value**.
The data in the field is not visible and is not included in worksheet calculations.
 - To include a value that you previously excluded, select **Exclude Value**.

To type a comment on a worksheet:

1. Select **Comments**. The Comments window opens.
2. Type comments about the exam.
3. To close the Comments window, select **Comments**.



HINTS

Some fields on the worksheet are view only, and others you can change or select. To easily see which fields you can change or select, move the **Trackball**. As the cursor moves over a field that you can change or select, the field is highlighted.

Chapter 3

After the Exam is Over

*Probe Overview, System Presets, DataBackup,
Configuring Connectivity, Electronic Documentation and
System Care and Maintenance*

Probe Overview

Probe handling and infection control

This information is intended to increase user awareness of the risks of disease transmission associated with using this equipment and provide guidance in making decisions directly affecting the safety of the patient as well as the equipment user.

Diagnostic ultrasound systems utilize ultrasound energy that must be coupled to the patient by direct physical contact. Depending on the type of examination, this contact occurs with a variety of tissues ranging from intact skin in a routine exam to recirculating blood in a surgical procedure. The level of risk of infection varies greatly with the type of contact.

One of the most effective ways to prevent transmission between patients is with single use or disposable devices. However, ultrasound transducers are complex and expensive devices that must be reused between patients. It is very important, therefore, to minimize the risk of disease transmission by using barriers and through proper processing between patients.



Risk of Infection. ALWAYS clean and disinfect the probe between patients to the level appropriate for the type of examination and use FDA-cleared probe sheaths where appropriate. See 'Supplies/Accessories' on *page 3-33* for ordering information.



Adequate cleaning and disinfection are necessary to prevent disease transmission. It is the responsibility of the equipment user to verify and maintain the effectiveness of the infection control procedures in use. Always use sterile, legally marketed probe sheaths for intra-cavitary and intra-operative procedures.

For neurological intra-operative procedures, use of a legally marketed, sterile, pyrogen free probe sheath is REQUIRED. Probes for neuro surgical use must not be sterilized with liquid chemical sterilants because of the possibility of neuro toxic residues remaining on the probe.

Endocavitary Probe Handling Precautions

If the sterilization solution comes out of the endocavitary probe, please follow the cautions below.



Sterile/sanitary sheaths are to be used on the probe during its actual use with patients. Wearing gloves protects the patient and operator.



Sterilant Exposure to Patient (e.g., Cidex)—Contact with a sterilant to the patient's skin or mucous membrane may cause an inflammation. If this happens, refer to the sterilant's instruction manual.

Sterilant Exposure from Probe Handle to Patient (e.g., Cidex)—DO NOT allow the sterilant to contact the patient. Only immerse the probe to its specified level. Ensure that no solution has entered the probe's handle before scanning the patient. If sterilant comes into contact with the patient, refer the the sterilant's instruction manual.

Sterilant Exposure from Probe Connector to Patient (e.g., Cidex)—DO NOT allow the sterilant to contact the patient. Only immerse the probe to its specified level. Ensure that no solution has entered the probe's connector before scanning the patient. If sterilant comes into contact with the patient, refer the the sterilant's instruction manual.

Endocavitary Probe Point of Contact—Refer to the sterilant's instruction manual.

Probe Cleaning Process

Cleaning probes

Perform After Each Use

To clean the probe:

1. Disconnect the probe from the ultrasound console and remove all coupling gel from the probe by wiping with a soft cloth and rinsing with flowing water.
2. Wash the probe with mild soap in lukewarm water. Scrub the probe as needed using a soft sponge, gauze, or cloth to remove all visible residue from the probe surface. Prolonged soaking or scrubbing with a soft bristle brush (such as a toothbrush) may be necessary if material has dried onto the probe surface.



Take extra care when handling the lens face of the Ultrasound transducer. The lens face is especially sensitive and can easily be damaged by rough handling. NEVER use excessive force when cleaning the lens face.

3. Rinse the probe with enough clean potable water to remove all visible soap residue.
4. Air dry or dry with a soft cloth.

Cleaning probes (continued)

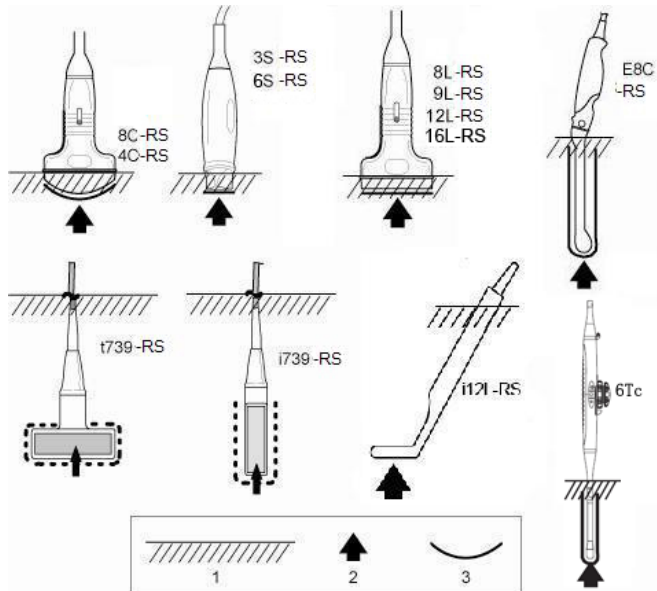


Figure 3-1. Probe Immersion Levels

1. Fluid Level
2. Aperture
3. Contact face within Patient Environment

Disinfecting probes

Perform After Each Use

Ultrasound probes can be disinfected using liquid chemical germicides. The level of disinfection is directly related to the duration of contact with the germicide. Increased contact time produces a higher level of disinfection.

Table 3-1: Description of Pictogram on Care card

Pictogram	Description
	"ATTENTION" - Consult accompanying documents" is intended to alert the user to refer to the operator manual or other instructions when complete information cannot be provided on the label.
	"CAUTION" - Dangerous voltage" (the lightning flash with arrowhead) is used to indicate electric shock hazards.
	Biohazard - Patient/user infection due to contaminated equipment. Usage • Cleaning and care instructions • Sheath and glove guidelines
	Ultrasound probes are highly sensitive medical instruments that can easily be damaged by improper handling. Use care when handling and protect from damage when not in use.
	Do not immerse the probe into any liquid beyond the level specified for that probe. Refer to the user manual of the ultrasound system.
	Since there is a possibility of having negative effects on the probe, observe the specified immersing time by the germicide manufacturer strictly. Do not immerse the probe in liquid chemical germicides more than the time prescribed in the care card.

Disinfecting probes (continued)



Review the probe care card that is packed with each probe. The following website contains the most current and up-to-date recommendations:

http://www.gehealthcare.com/us/en/ultrasound/products/probe_care.html

Cidex Plus has been approved for all probes available on the LOGIQ e.

Pera Safe high level disinfectant has been approved for the E8C-RS, 8C-RS and 12L-RS probes.

T-spray low-level disinfectant has been approved for the E8C-RS, 8C-RS, 12L-RS, 3S-RS and 8L-RS probes. T-Spray II has been approved for all the probes available on the LOGIQ e except 6Tc-RS.

Disinfecting probes (continued)



In order for liquid chemical germicides to be effective, all visible residue must be removed during the cleaning process. Thoroughly clean the probe, as described earlier before attempting disinfection.

You **MUST** disconnect the probe from the LOGIQ e prior to cleaning/disinfecting the probe. Failure to do so could damage the system.

DO NOT soak probes in liquid chemical germicide for longer than is stated by the germicide instructions for use. Extended soaking may cause probe damage and early failure of the enclosure, resulting in possible electric shock hazard.

1. Prepare the germicide solution according to the manufacturer's instructions. Be sure to follow all precautions for storage, use and disposal.
2. Place the cleaned and dried probe in contact with the germicide for the time specified by the germicide manufacturer. High-level disinfection is recommended for surface probes and is required for endocavitary and intraoperative probes (follow the germicide manufacturer's recommended time).

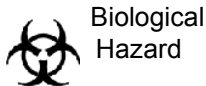


Probes for neuro surgical intra-operative use must **NOT** be sterilized with liquid chemical sterilants because of the possibility of neuro toxic residues remaining on the probe. Neurological procedures must be done with the use of legally marketed, sterile, pyrogen free probe sheaths.

3. After removing from the germicide, rinse the probe following the germicide manufacturer's rinsing instructions. Flush all visible germicide residue from the probe and allow to air dry.

Disinfecting probes (continued)**CREUTZFELD-JAKOB DISEASE**

Failure of the probe sheath or direct contact of the probe with dura or any intra-cranial tissue of patients with Creutzfeld-Jakob disease requires that the probe be destroyed. There is no effective means for decontamination of the probe. For more information, see the Center of Disease Control and Prevention <http://www.cdc.gov/ncidod/hip/sterile/cjd.htm>.



Ultrasound transducers can easily be damaged by improper handling and by contact with certain chemicals. Failure to follow these precautions can result in serious injury and equipment damage.

- Do not immerse the probe into any liquid beyond the level specified for that probe. Never immerse the transducer connector or probe adapters into any liquid.
- Avoid mechanical shock or impact to the transducer and do not apply excessive bending or pulling force to the cable.
- Transducer damage can result from contact with inappropriate coupling or cleaning agents:
 - Do not soak or saturate transducers with solutions containing alcohol, bleach, ammonium chloride compounds or hydrogen peroxide
 - Avoid contact with solutions or coupling gels containing mineral oil or lanolin
 - Avoid temperatures above 60°C.
- Inspect the probe prior to use for damage or degeneration to the housing, strain relief, lens and seal. Do not use a damaged or defective probe.

Coupling gels



Do not use unrecommended gels (lubricants). They may damage the probe and void the warranty.

Applying

In order to assure optimal transmission of energy between the patient and probe, a conductive gel or couplant must be applied liberally to the patient where scanning will be performed.



Do not apply gel to the eyes. If there is gel contact to the eye, flush eye thoroughly with water.

Precautions

Coupling gels should not contain the following ingredients as they are known to cause probe damage:

- Methanol, ethanol, isopropanol, or any other alcohol-based product
- Mineral oil
- Iodine
- Lotions
- Lanolin
- Aloe Vera
- Olive Oil
- Methyl or Ethyl Parabens (para hydroxybenzoic acid)
- Dimethylsilicone
- Polyether glycol based

System Presets

Foreign Language Keyboard Setup

Keyboard Setup for non-Russian/Greek/Chinese/Japanese Languages

To set up the keyboard for non-Russian/Greek/Chinese/Japanese languages:

NOTE: *You must apply the changes on each setup page before moving to the next page.*

1. In Utility--> System--> General, set the Language as desired. Save this setting.
2. Press Regional Options, select the Language tab, press Details, under Installed Services press Add to set the Keyboard layout/IME to United States-International, press OK, set the Default input language to English (United States) - United States International, press Apply, Press OK.

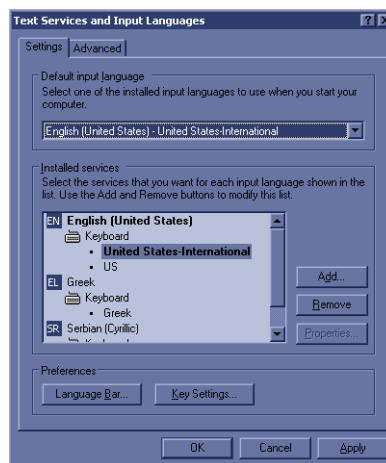


Figure 3-2. Selecting the International Keyboard

Keyboard Setup for non-Russian/Greek/Chinese/Japanese Languages (continued)

3. Select the Advanced tab, then select the language in the Language for non-Unicode programs pull-down menu. Press Apply. Answer Yes to use files already loaded on the hard disk, then answer No to not reboot the system yet, press OK. Press Save and Exit the Utility screen.

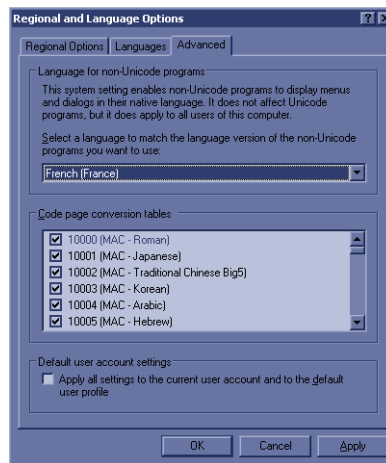


Figure 3-3. Set Language

4. Reboot the system. When your system restarts, the system appears in the selected language.
5. To type foreign characters, press Ctrl+Shift to change the keyboard to the international keyboard.

Keyboard Setup Procedure for Russian/Greek/Chinese/Japanese

1. In Utility--> System--> General, set the Language as Russian/Greek/Chinese/Japanese. Save this setting.

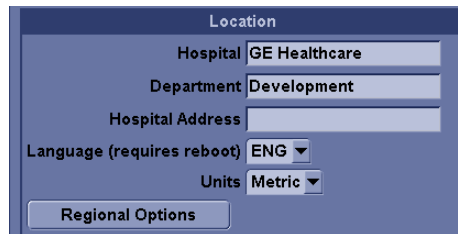


Figure 3-4. Changing the System Language to Russian/Greek/Chinese/Japanese

2. Press Regional Options, under Standards and Formats select Russian, Greek, Japanese or Chinese (PRC). Under Location select Russia, Greece, Japan or China. Press Apply.

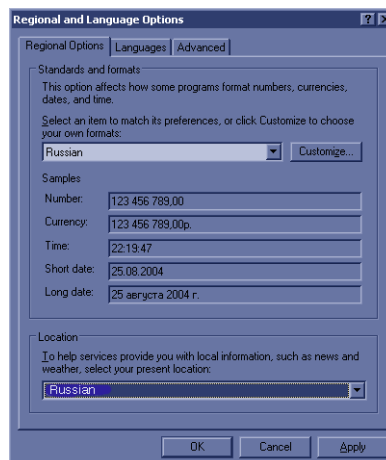


Figure 3-5. Regional Options

3. Select the Language tab, press Details, under Installed Services select the Russian, Greek, Japanese or Chinese (PRC) keyboard, under Default input language select Russian - Russian, Greek - Greek, Japanese - Japanese or Chinese (PRC) - Microsoft IME 3.0. Press Apply, Press OK.

Keyboard Setup Procedure for Russian/Greek/Chinese/Japanese (continued)

4. Select the Advanced tab, then select Russian, Greek, Japanese or Chinese (PRC) in the Language for non-Unicode programs pull-down menu. Press Apply. Answer Yes to use files already loaded on the hard disk, then answer No to not reboot the system yet, press OK. Press Save and Exit the Utility screen.

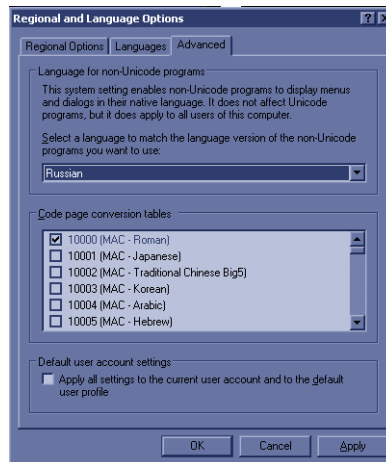


Figure 3-6. Set Language

5. Reboot the system. When your system restarts, the system appears in the selected language.
6. To switch between the English and Russian (or Greek or Japanese or Chinese) keyboard, press Ctrl+Shift to change the keyboard to the Russian, Greek or Chinese keyboard.
7. Apply the changes by pressing Apply. Press OK TWICE.

NOTE: To have the settings take effect, you **MUST** turn off the system and turn it back on.

Keyboard Setup Procedure for Russian/Greek/Chinese/Japanese (continued)

Here is an example of the Russian keyboard:

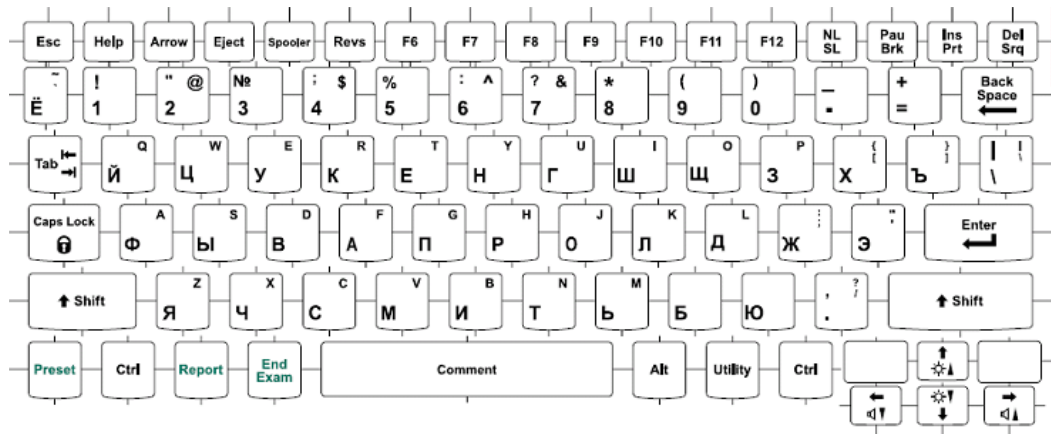


Figure 3-7. Russian Keyboard

Backup and Restore

Backup and restore strategy: patient data

To minimize accidental loss of data, perform backup of the patient archives stored on the local hard drive **DAILY** as described in this section. Use a Backup/Restore disk to back up patient archives from the hard drive, using the backup procedure described in this section. Data from the Backup/Restore disk may be restored to the local hard drive using the restore procedure.



The restore procedure overwrites the existing database on the local hard drive.



Make sure to verify the media after writing of data, such as EZBackup, SaveAs or Export.

Before deleting a patient or image from the patient screen, make sure you have saved the data by EZBackup/Backup or Export and verify that the media transfer of data was successful.

NOTE: *To perform backup and restore procedures, you must login with administrator privileges.*

Restore procedure: patient data



The restore procedure overwrites the existing database on the local hard drive. Make sure to insert the correct media.

You cannot restore the data between systems with different software versions.

1. Insert the media into the media drive.
2. On the Control Panel, press **Utility**.
3. Select **System**.
4. On the monitor display, select Backup/Restore. The Backup/Restore screen is displayed.

NOTE: *If you are not logged in with administrator privileges, the Operator Login window is displayed. Log on with administrator privileges.*

5. In the Restore list, select Patient Archive.
6. In the Media field, select the Backup/Restore media.
7. Select Restore.

The system performs the restore. As it proceeds, status information is displayed on the Backup/Restore screen.

Backup procedure: user-defined configurations



To avoid the risk of overwriting the local patient archives on the system to update, DO NOT check Patient Archive when making a backup of configuration settings.

1. Insert media into the media drive.
2. On the Control Panel, press **Utility**.
3. Select **System**.
4. On the monitor display, select Backup/Restore.
The Backup/Restore screen is displayed.

NOTE: *If you are not logged in with administrator privileges, the Operator Login window is displayed. Log on with administrator privileges.*

5. In the Backup list, select User Defined Configuration.
6. In the Media field, select a media.
7. Select Backup.
The system performs the backup. As it proceeds, status information is displayed on the Backup/Restore screen.
8. After the backup is complete, press **F3** to eject the media.

Restore procedure: user-defined configurations



The restore procedure overwrites the existing database on the local hard drive. Make sure to insert the correct media.

DO NOT restore data between systems with different software versions.



To avoid the risk of overwriting the local patient archives, DO NOT check Patient Archive when restoring user-defined configurations.

NOTE:

1. Insert the media with the user-defined configurations into the drive.
2. On the Control Panel, press **Utility**.
3. Select **System**.
4. On the monitor display, select Backup/Restore.
The Backup/Restore screen is displayed.

If you are not logged in with administrator privileges, the Operator Login window is displayed. Log on with administrator privileges.

5. In the Restore list, select from the following, depending on which configurations you want to restore:
 - User Defined Configuration
Select the parameters to be restored in the Detailed Restore section.
 - Imaging Presets
 - Connectivity Configuration
 - Measurement Configuration
 - Comment/Body Pattern Configuration
 - All Others
6. In the Media field, select the media.
7. Select Restore.

The system performs the restore. As it proceeds, status information is displayed on the System/Backup/Restore screen. The system restarts.

Configuring Connectivity

Overview

You use Connectivity functionality to set up the connection and communication protocols for the ultrasound system. This page gives an overview of each of the Connectivity functions. Each function is described in detail in the following pages.

Connectivity Functions

To set up your institution's connectivity, you must login with administrator privileges.

1. **TCPIP:** allows you to configure the Internet Protocol.
2. **Device.** allows you to set up devices.
3. **Service:** allows you to configure a service (for example, DICOM services such as printers, worklist, and other services such as video print and standard print) from the list of supported services. This means that the user can configure a device with the DICOM service(s) that particular device supports.
4. **Dataflow:** allows you to adjust the settings of the selected dataflow and associated services. Selecting a dataflow customizes the ultrasound system to work according to the services associated with the selected dataflow.
5. **Button:** allows you to assign a pre-configured output service (or a set of output services) to the Print keys on the control panel.
6. **Removable Media:** enables formatting (DICOM, database, or blank formatting) and DICOM verification of removable media.
7. **Miscellaneous:** allows you to set up the patient exam menu options, print and store options, and the order of the columns in the examination list on the Patient menu.

Configure these screens from left to right, starting with the Tcpiip tab first.

NOTE: *The ultrasound system is pre-configured for many services, with default settings selected. You can change these services and settings as needed.*



You must restart the LOGIQ e after making any changes to connectivity settings in the Utility menus. This includes any changes on the TCPIP - Device Properties or dataflow setup screens.

Electronic Documentation

Accessing Documentation Via a PC

To view user documentation on a PC,

1. Insert the media into the media drive.
2. Open the media drive on your desktop.
3. Double click on the 'gedocumentation.html' document.
4. Select the item you want to view (click on the blue, underlined link in the File Name column).

To close the window, click on the 'X' in the upper, right-hand corner of the browser window.

NOTE: *If your PC does not have Adobe Reader, a free download is available on the Adobe website at <http://www.adobe.com>.*

Using Online Help Via F1

Online Help is available via the F1 key. After pressing F1, Help appears. The Help screen is divided into three sections: navigational tools on the top, left portion of the screen (Hide, Back, Forward), help book navigational tools on the left portion of the screen (Contents, Index, Search, Favorites), and the content portion on the right side of the screen where help topics are displayed.

NOTE: *If the cursor is lost while using Online Help, press **Alt + F4** to exit or press **F1** to activate the cursor.*

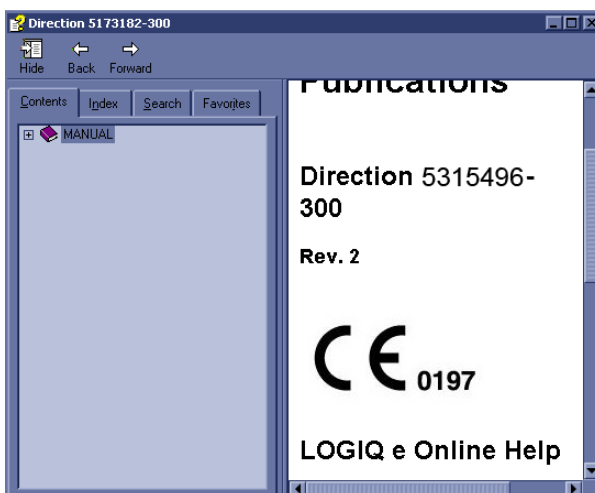


Figure 3-8. Opening Help Screen

Exiting Online Help

To exit Online Help, press the 'X' in the upper, right-hand corner of the Online Help window.

Contact Information

Contacting GE Healthcare Ultrasound

For additional information or assistance, please contact your local distributor or the appropriate support resource listed on the following pages:

INTERNET

<http://www.gehealthcare.com>

http://www.gehealthcare.com/usen/ultrasound/products/probe_care.html

USA

GE Healthcare TEL: (1) 800-437-1171
Ultrasound Service Engineering FAX: (1) 414-721-3865
9900 Innovation Drive
Wauwatosa, WI 53226

Clinical Questions

For information in the United States, Canada, Mexico and parts of the Caribbean, call the Customer Answer Center
TEL: (1) 800-682-5327 or (1) 262-524-5698

In other locations, contact your local Applications, Sales or Service Representative.

Service Questions

For service in the United States, call GE CARES

TEL: (1) 800-437-1171

For service for compact products in the United States, call

TEL: (1) 877-800-6776

In other locations, contact your local Service Representative.

Accessories Catalog Requests

To request the latest GE Accessories catalog or equipment brochures in the United States, call the Response Center

TEL: (1) 800-643-6439

In other locations, contact your local Applications, Sales or Service Representative.

Contacting GE Healthcare Ultrasound (continued)

Placing an Order To place an order, order supplies or ask an accessory-related question in the United States, call the GE Access Center

TEL: (1) 800-472-3666

In other locations, contact your local Applications, Sales or Service Representative.

CANADA GE Healthcare TEL: (1) 800-668-0732
Ultrasound Service Engineering
9900 Innovation Drive
Wauwatosa, WI 53226
Customer Answer Center TEL: (1) 262-524-5698

LATIN & SOUTH AMERICA GE Healthcare TEL: (1) 262-524-5300
Ultrasound Service Engineering
9900 Innovation Drive
Wauwatosa, WI 53226
Customer Answer Center TEL: (1) 262-524-5698

EUROPE GE Ultraschall TEL: 0130 81 6370 toll free
Deutschland GmbH & Co. KG TEL: (33) 130.831.300
Beethovenstrasse 239 FAX: (49) 212.28.02.431
Postfach 11 05 60
D-42655 Solingen

ASIA GE Ultrasound Asia (Singapore) TEL: 65-291 8528
Service Department - Ultrasound FAX: 65-272-3997
298 Tiong Bahru Road #15-01/06
Central Plaza
Singapore 169730

JAPAN GE Healthcare Japan Corporation TEL: (81) 42-648-2910
Customer Service Center FAX: (81) 42-648-2905

Contacting GE Healthcare Ultrasound (continued)

ARGENTINA	GEME S.A. TEL: (1) 639-1619 Miranda 5237 FAX: (1) 567-2678 Buenos Aires - 1407
AUSTRIA	GE GesmbH Medical Systems Austria TEL: 0660 8459 toll free Prinz Eugen Strasse 8/8 FAX: +43 1 505 38 74 A-1040 WIEN TLX: 136314
BELGIUM	GE Healthcare BVBA TEL: +32 0 2 719 72 04 Kouterveldstraat 20 FAX: +32 0 2 719 72 05 B-1831 Diegem
BRAZIL	GE Sistemas Medicos TEL: 0800-122345 Av Nove de Julho 5229 FAX: (011) 3067-8298 01407-907 Sao Paulo SP
CHINA	GE Healthcare - Asia TEL: (8610) 5806 9403 No. 1, Yongchang North Road FAX: (8610) 6787 1162 Beijing Economic & Technology Development Area Beijing 100176, China
DENMARK	GE Medical Systems TEL: +45 4348 5400 Fabriksparken 20 FAX: +45 4348 5399 DK-2600 GLOSTRUP
FRANCE	GE Medical Systems TEL: 05 49 33 71 toll free 738 rue Yves Carmen FAX: +33 1 46 10 01 20 F-92658 BOULOGNE CEDEX
GERMANY	GE Ultraschall TEL: 0130 81 6370 toll free Deutschland GmbH & Co. KG TEL: (49) 212.28.02.207 Beethovenstrasse 239 FAX: (49) 212.28.02.431 Postfach 11 05 60 D-42655 Solingen
GREECE	GE Medical Systems Hellas TEL: +30 1 93 24 582 41, Nikolaou Plastira Street FAX: +30 1 93 58 414 G-171 21 NEA SMYRNI
ITALY	GE Medical Systems Italia TEL: 1678 744 73 toll free Via Monte Albenza 9 FAX: +39 39 73 37 86 I-20052 MONZA TLX: 3333 28
LUXEMBOURG	TEL: 0800 2603 toll free

Contacting GE Healthcare Ultrasound (continued)

MEXICO	GE Sistemas Medicos de Mexico S.A. de C.V. Rio Lerma #302, 1° y 2° Pisos TEL: (5) 228-9600 Colonia Cuauhtemoc FAX: (5) 211-4631 06500-Mexico, D.F.
NETHERLANDS	GE Medical Systems Nederland B.V. TEL: 06 022 3797 toll free Atoomweg 512 FAX: +31 304 11702 NL-3542 AB UTRECHT
POLAND	GE Medical Systems Polska TEL: +48 2 625 59 62 Krzywickiego 34 FAX: +48 2 615 59 66 P-02-078 WARSZAWA
PORTUGAL	GE Medical Systems Portuguesa S.A. TEL: 05 05 33 7313 toll free Rua Sa da Bandeira, 585 FAX: +351 2 2084494 Apartado 4094 TLX: 22804 P-4002 PORTO CODEX
RUSSIA	GE VNIIEM TEL: +7 495 739 6931 18C, Krasnopresnenskaya nab. FAX: +7 495 739 6932 MOSCOW 123317 TLX: 613020 GEMED SU
SPAIN	GE Healthcare TEL: +34 (91) 663 25 00 Edificio Gobelas I FAX: +34 (91) 663 25 01 C/ Gobelas 35-37 E- 28023-Madrid
SWEDEN	GE Medical Systems TEL: 020 795 433 toll free PO-BOX 1243 FAX: +46 87 51 30 90 S-16428 KISTA TLX: 12228 CGRSWES
SWITZERLAND	GE Medical Systems (Schweiz) AG TEL: 155 5306 toll free Sternmattweg 1 FAX: +41 41 421859 CH-6010 KRIENS
TURKEY	GE Healthcare Turkiye TEL: +90 212 366 29 00 Sun Plaza FAX: +90 212 366 29 99 Dereboyu Sok. No 24/7 34398 Maslak ISTANBUL

Contacting GE Healthcare Ultrasound (continued)

UNITED KINGDOM	GE Medical Systems TEL: 0800 89 7905 toll free Coolidge House FAX: +44 753 696067 352 Buckingham Avenue SLOUGH Berkshire SL1 4ER
OTHER COUNTRIES	NO TOLL FREE TEL: international code + 33 1 39 20 0007

Manufacturer

GE Medical Systems (China) Co., Ltd.
No. 19, Changjiang Road
WuXi National Hi-Tech Development Zone
Jiangsu, P.R. China 214028
TEL: +86 510 85225888; FAX: +86 510 85226688

Factory Sites

GE Medical Systems (China) Co., Ltd.
No. 19, Changjiang Road
WuXi National Hi-Tech Development Zone
Jiangsu, P.R. China 214028
TEL: +86 510 85225888; FAX: +86 510 85226688

GE Medical Systems
Ultrasound & Primary Care
Diagnostics, LLC
Also DBA GE Healthcare
9900 Innovation Drive
Wauwatosa, WI 53226
U.S.A

System Care and Maintenance

Inspecting the System

Examine the following on a monthly basis:

- Connectors on cables for any mechanical defects.
- Entire length of electrical and power cables for cuts or abrasions.
- Equipment for loose or missing hardware.
- Control panel and keyboard for defects.
- Casters for proper locking operation.



To avoid electrical shock hazard, do not remove panels or covers from console. This servicing must be performed by qualified service personnel. Failure to do so could cause serious injury.



If any defects are observed or malfunctions occur, do not operate the equipment but inform a qualified service person. Contact a Service Representative for information.

Weekly Maintenance

Failure to perform required maintenance may result in unnecessary service calls.

Prior to cleaning any part of the system:

1. Turn off the system power. If possible, disconnect the power cord. See 'Power Off' on *page 1-19 for more information*.

System Cabinet

To clean the system cabinet:

1. Moisten a soft, non-abrasive folded cloth.
2. Wipe down the top, front, back, and both sides of the system cabinet.

NOTE: Do not spray any liquid directly into the unit.

LCD Monitor

To clean the monitor face:

Use a soft, folded cloth. Gently wipe the monitor face.

Do NOT use a glass cleaner that has a hydrocarbon base (such as Benzene, Methyl Alcohol or Methyl Ethyl Ketone) on monitors with the filter (anti-glare shield). Hard rubbing will also damage the filter.

NOTE: When cleaning the screen, make sure not to scratch the LCD.

Operator Controls

To clean the operator control panel:

1. Moisten a soft, non-abrasive folded cloth with a mild, general purpose, non-abrasive soap and water solution.
2. Wipe down operator control panel.
3. Use a cotton swab to clean around keys or controls. Use a toothpick to remove solids from between keys and controls.

NOTE: *When cleaning the operator control panel, make sure not to spill or spray any liquid on the controls, into the system cabinet, or in the probe connection receptacle.*

NOTE: *In case of SARS, use bleach, alcohol, or Cidex in a normal diluted form for cleaning/disinfecting the operator panel.*

NOTE: *DO NOT use T-spray or Sani Wipes on the control panel.*

Touch Screen

To clean the Touch Screen, moisten a soft, non-abrasive folded cloth with lukewarm water and wipe the external surface. It can also be wiped by using the Sani-cloth HB.

Replacing illuminated key caps/lamps

Contact a local Service Representative when a key cap or lamp needs to be replaced.

Other Peripheral Maintenance

Refer to the peripheral manuals for more information.

Other Maintenance

Optimum Ultrasound system performance is your facility's responsibility. Ensure that your facility establishes a regular maintenance program at the appropriate time intervals to perform the following tasks:

- inspect the system, probes, and peripherals
- clean system parts
- test leakage current
- verify measurement accuracy
- assure probe quality with phantom checks

Your facility's Biomedical Department may perform this service; or contact the GE Service Representative to verify/contract for coverage.

Battery Replacement and Disposition

Battery replacement every three years is recommended.

Contact a local Service Representative for the replacement of the battery. Used batteries will be discarded appropriately by GE.

NOTE: Disposing of the battery should meet local law and regulatory requirements.

NOTE: Dispose of the system according to local law and regulatory requirements.

Supplies/Accessories



DO NOT connect any probes or accessories without approval by GE.

Not all features or products described in this document may be available or cleared for sale in all markets.

The following supplies/accessories have been verified to be compatible with the system:

Peripherals

Table 3-2: Peripherals and Accessories

Accessory	Units
Sony B/W Printer	Each
Sony Digital Color Printer	Each
HP470 Printer	Each
HP 8600 PC Printer	Each
DVD R/W	Each
USB Wireless Card	Each
Measure Transfer Kit	Each
USB Memory Stick	Each
USB Hub Assy	Each
ECG-USB	Each
USB HDD	Each
Docking Cart	Each
BarCode Reader	Each
Sandisk U3 USB Flash Drive	Each
Video Transfer	Each

Console

Table 3-3: Console Accessories

Accessory	Units
Footswitch model FSU-1000	Each
Footswitch model MKF 2- MED GP26	Each
Battery Pack model	Each

Probes

Table 3-4: Probes and Accessories

Accessory	Units
4C-RS	Each
8C-RS	Each
E8C-RS	Each
8L-RS	Each
9L-RS	Each
12L-RS	Each
16L-RS	Each
i12L-RS	Each
3S-RS	Each
i739-RS/t739-RS	Each
*6Tc-RS	Each
*6S-RS	Each
NOTE: 16L-RS is not available in China	
*NOTE: LOGIQ e R6.x.x only	

Gel

Table 3-5: Gel

Accessory	Units
Thermasonic Gel Warmer	Holds three plastic bottles (250ml or 8 oz)
Aquasonic 100 Scan Gel	5 liter jug
	250 ml plastic bottles (12/ case)
Scan Ultrasound Gel	8 oz plastic bottles (12/ case)
	1 gallon plastic jug
	Four 1-gallon plastic jugs

Disinfectant

Table 3-6: Disinfectant

Accessory	Units
Cidex Activated Dialdehyde	16/1 quart bottles
	4/1 gallon bottles
	2/2.5 gallon bottles

Ultrasound Probe and Cord Sheath Sets

Table 3-7: Probe and Cord Sheath Sets

Accessory	Units
Sterile Ultrasound Probe Sheath Set	20 Per Set
Sterile Ultrasound Cord Sheath Set	20 Per Set
Sanitary Rectal/Vaginal Probe Cover	20 Per Set
Sterile Combination Probe and Cord Cover Set	12 Per Set
Sterile Ultrasound Probe Sheath Set for Wide (2.5 and 3.5) Aperture Sector Probes	20 Per Set

Chapter 4

Safety

Describes the safety and regulatory information pertinent for operating this ultrasound system.

Safety Precautions

Precaution Levels

Icon description

Various levels of safety precautions may be found on the equipment and different levels of concern are identified by one of the following flag words and icons which precede the precautionary statement.



Indicates that a specific hazard is known to exist which through inappropriate conditions or actions will cause:

- Severe or fatal personal injury
- Substantial property damage.



Indicates that a specific hazard is known to exist which through inappropriate conditions or actions may cause:

- Severe personal injury
- Substantial property damage.



Indicates that a potential hazard may exist which through inappropriate conditions or actions will or can cause:

- Minor injury
- Property damage.

NOTE: *Indicates precautions or recommendations that should be used in the operation of the ultrasound system, specifically:*

- *Maintaining an optimum system environment*
- *Using this Manual*
- *Notes to emphasize or clarify a point.*

Hazard Symbols

Icon Description

Potential hazards are indicated by the following icons:

Table 4-1: Potential Hazards

Icon	Potential Hazard	Usage	Source
	• Patient/user infection due to contaminated equipment.	• Cleaning and care instructions • Sheath and glove guidelines	ISO 7000 No. 0659
	• Electrical micro-shock to patient, e.g., ventricular	• Probes • ECG, if applicable • Connections to back panel	
	• Patient injury or tissue damage from ultrasound radiation.	• ALARA, the use of Power Output following the 'as low as reasonably achievable' principle	
	• Risk of explosion if used in the presence of flammable anesthetics.	• Flammable anesthetic	
	• Patient/user injury or adverse reaction from fire or smoke. • Patient/user injury from explosion and fire.	• Replacing fuses • Outlet guidelines	

Important Safety Considerations

The following topic headings (Patient Safety, and Equipment and Personnel Safety) are intended to make the equipment user aware of particular hazards associated with the use of this equipment and the extent to which injury can occur if precautions are not observed. Additional precautions may be provided throughout the manual.



Improper use can result in serious injury. The user must be thoroughly familiar with the instructions and potential hazards involving ultrasound examination before attempting to use the device. Training assistance is available from GE Medical Systems if needed.

The equipment user is obligated to be familiar with these concerns and avoid conditions that could result in injury.

Patient Safety

Related Hazards



The concerns listed can seriously affect the safety of patients undergoing a diagnostic ultrasound examination.

Patient identification

Always include proper identification with all patient data and verify the accuracy of the patient's name and ID numbers when entering such data. Make sure correct patient ID is provided on all recorded data and hard copy prints. Identification errors could result in an incorrect diagnosis.

If the LOGIQ e needs to be sent for repair, ensure that any patient information is backup and erased from the system before shipping. In case that any patient information is still residing on the LOGIQ e, GE will contact the customer and request for urgent collection of that patient information. GE will keep this patient information in a secure environment for a maximum period of 1 month. All patient information will be permanently deleted at that point.

Diagnostic information

Equipment malfunction or incorrect settings can result in measurement errors or failure to detect details within the image. The equipment user must become thoroughly familiar with the equipment operation in order to optimize its performance and recognize possible malfunctions. Applications training is available through the local GE representative. Added confidence in the equipment operation can be gained by establishing a quality assurance program.

Related Hazards (continued)

Mechanical hazards

The use of damaged probes can result in injury or increased risk of infection. Inspect probes often for sharp, pointed, or rough surface damage that could cause injury or tear protective barriers. Become familiar with all instructions and precautions provided with special purpose probes.



Electrical Hazard

A damaged probe can also increase the risk of electric shock if conductive solutions come in contact with internal live parts. Inspect probes often for cracks or openings in the housing and holes in and around the acoustic lens or other damage that could allow liquid entry. Become familiar with the probe's use and care precautions outlined in *Probes and Biopsy*.



CAUTION

Ultrasound transducers are sensitive instruments which can easily be damaged by rough handling. Take extra care not to drop transducers and avoid contact with sharp or abrasive surfaces. A damaged housing, lens or cable can result in patient injury or serious impairment or operation.



CAUTION

Ultrasound can produce harmful effects in tissue and potentially result in patient injury. Always minimize exposure time and keep ultrasound levels low when there is no medical benefit. Use the principle of ALARA (As Low As Reasonably Achievable), increasing output only when needed to obtain diagnostic image quality. Observe the acoustic output display and be familiar with all controls affecting the output level. See the *Bioeffects* section of the *Acoustic Output* chapter in the *Advanced Reference Manual* for more information.

Related Hazards (continued)

Training It is recommended that all users receive proper training in applications before performing them in a clinical setting. Please contact the local GE representative for training assistance.

ALARA training is provided by GE Application Specialists. The ALARA education program for the clinical end-user covers basic ultrasound principles, possible biological effects, the derivation and meaning of the indices, ALARA principles, and examples of specific applications of the ALARA principle.

Equipment and Personnel Safety

Related Hazards



This equipment contains dangerous voltages that are capable of serious injury or death.

If any defects are observed or malfunctions occur, stop operating the equipment and perform the proper action for the patient. Inform a qualified service person and contact a Service Representative for information.

There are no user serviceable components inside the console. Refer all servicing to qualified service personnel only.



Only approved and recommended peripherals and accessories should be used.

All peripherals and accessories must be securely mounted to the LOGIQ e.



The concerns listed below can seriously affect the safety of equipment and personnel during a diagnostic ultrasound examination.



Risk of explosion if used in the presence of flammable anesthetics.

Related Hazards (continued)



Electrical Hazard

To avoid injury:

- Do not remove protective covers. No user serviceable parts are inside. Refer servicing to qualified service personnel.
- To assure adequate grounding, connect the attachment plug to a reliable (hospital grade) grounding outlet (having equalization conductor ▽).
- Never use any adaptor or converter of a three-prong-to-two-prong type to connect with a mains power plug. The protective earth connection will loosen.
- Do not place liquids on or above the console. Spilled liquid may contact live parts and increase the risk of shock.



CAUTION

Do not use this equipment if a safety problem is known to exist. Have the unit repaired and performance verified by qualified service personnel before returning to use.



Smoke & Fire Hazard

The system must be supplied from an adequately rated electrical circuit. The capacity of the supply circuit must be as specified.



Biological Hazard

For patient and personnel safety, be aware of biological hazards while performing invasive procedures. To avoid the risk of disease transmission:

- Use protective barriers (gloves and probe sheaths) whenever possible. Follow sterile procedures when appropriate.
- Thoroughly clean probes and reusable accessories after each patient examination and disinfect or sterilize as needed. Refer to *Probes and Biopsy* for probe use and care instructions.
- Follow all infection control policies established by your office, department or institution as they apply to personnel and equipment.

Related Hazards (continued)



Contact with natural rubber latex may cause a severe anaphylactic reaction in persons sensitive to the natural latex protein. Sensitive users and patients must avoid contact with these items. Refer to package labeling to determine latex content and FDA's March 29, 1991 Medical Alert on latex products.



Archived data is managed at the individual sites. Performing data backup (to any device) is recommended.



DO NOT use high-frequency surgical equipment with the LOGIQ e.

General Caution



Standard maintenance must be performed by authorized service personnel for the lifetime of the product (7 years).



Proceed cautiously when crossing door or elevator thresholds with the Docking Cart or Isolation Cart. Use the handle to push/pull the system, e.g., do not use the Docking Cart external LCD. Failure to do so may cause serious injury or system damage.



Capacity load of the Docking Cart: The maximum capacity load of the Storage rack (1) is 2kg, DVD-RW Shelf (2) is 2kg, B/W Printer Shelf (3) is 4kg, Color Printer Shelf (4) is 7kg, and UPS Shelf (5) is 9kg, refer to the following figure.



Figure 4-1. Capacity load of the Docking Cart

General Caution (continued)



Capacity load of the Isolation Cart: The maximum capacity load of B/W Printer (1) is 4kg, Color Printer Shelf (2) is 7kg, DVD-RW Shelf (3) is 2kg and Bottom Shelf (4) is 6kg, refer to the following figure.



Figure 4-2. Capacity load of the Isolation Cart

General Caution (continued)



Capacity load of the Isolation Cart Enhanced Version: The maximum capacity load of Basket (1) and Drawer (5) is 3kg, ACDC Shelf (2) is 1.5kg, DVD-RW Shelf (3) is 1.5kg and B/W Printer Shelf (4) is 3kg, refer to the following figure.

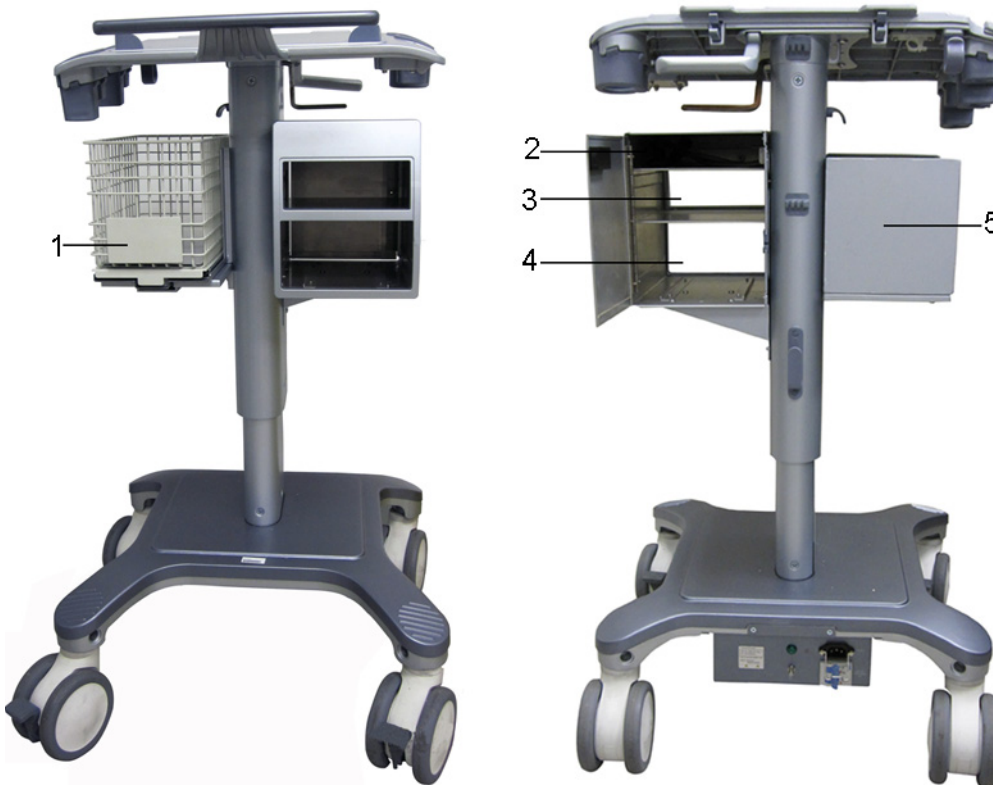


Figure 4-3. Capacity load of the Isolation Cart Enhanced Version

Device Labels

Label Icon Description

The following table describes the purpose and location of safety labels and other important information provided on the equipment.

Table 4-2: Label Icons

Label/Icon	Purpose/Meaning	Location
Identification and Rating Plate 	• Manufacture's name and address • Date of manufacture • Model and serial numbers • Electrical ratings (Volts, Amps, phase, and frequency)	AC Adapter Label.
Type/Class Label	Used to indicate the degree of safety or protection.	
IP Code (IPX8) IPX8: MKF 2-MED GP26, FSU-1000	Indicates the degree of protection provided by the enclosure per IEC60 529. IPX8 can be used in an operating room environment.	Bottom of Footswitch
	Authorized European Representative address.	
	United States only Prescription Requirement label.	
	Type BF Applied Part (man in the box) symbol is in accordance with IEC 878-02-03.	Beside the probe connector
	General Warning.	Various
	"CAUTION" - Dangerous voltage" (the lightning flash with arrowhead) is used to indicate electric shock hazards.	Various

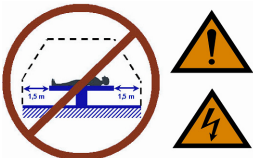
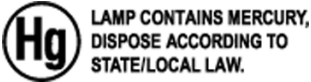
Table 4-2: Label Icons (Continued)

Label/Icon	Purpose/Meaning	Location
	"ON" indicates the power on position of the power switch. CAUTION: This Power Switch DOES NOT ISOLATE Mains Supply.	See the Console Overview section for location information.
	"Protective Earth" indicates the protective earth (grounding) terminal.	Inside of AC adapter
	NRTL Listing and Certification Mark is used to designate conformance to nationally recognized product safety standards. The Mark bears the name and/or logo of the testing laboratory, product category, safety standard to which conformity is assessed and a control number.	Bottom
	Type CF Defib-Proof Applied Part (heart in the box with paddle) symbol is in accordance with IEC 60878-02-06.	ECG Module
	"Consult accompanying documents" is intended to alert the user to refer to the operator manual or other instructions when complete information cannot be provided on the label.	Various
	Do not push the system.	Rear of Docking Cart/Isolation Cart
	This symbol indicates that waste electrical and electronic equipment must not be disposed of as unsorted municipal waste and must be collected separately. Please contact an authorized representative of the manufacturer for information concerning the decommissioning of your equipment.	Bottom

Table 4-2: Label Icons (Continued)

Label/Icon	Purpose/Meaning	Location
	The separate collection symbol is affixed to a battery, or its packaging, to advise you that the battery must be recycled or disposed of in accordance with local or country laws. The letters below the separate collection symbol indicate whether certain elements (Pb=Lead, Cd=Cadmium, Hg=Mercury) are contained in the battery. To minimize potential effects on the environment and human health, it is important that all marked batteries that you remove from the product are properly recycled or disposed. For information on how the battery may be safely removed from the device, please consult the service manual or equipment instructions. Information on the potential effects on the environment and human health of the substances used in batteries is available at this url: http://www.gehealthcare.com/euen/weee-recycling/index.html	Battery Pack if contains Pb/Cd/Hg
	No hazardous substance, above the maximum concentration value, is present. Maximum concentration values for electronic information products, as set by the People's Republic of China Electronic Industry Standard SJ/T11364-2006, include the hazardous substances of lead, mercury, hexavalent chromium, cadmium, polybrominated biphenyl (PBB), and polybrominated diphenyl ether (PBDE).	

Table 4-2: Label Icons (Continued)

Label/Icon	Purpose/Meaning	Location
	Indicates the presence of hazardous substance(s) above the maximum concentration value. Maximum concentration values for electronic information products, as set by the People's Republic of China Electronic Industry Standard SJ/T11364-2006, include the hazardous substances of lead, mercury, hexavalent chromium, cadmium, polybrominated biphenyl (PBB), and polybrominated diphenyl ether (PBDE). "10" indicates the number of years during which the hazardous substance(s) will not leak or mutate so that the use of this product will not result in any severe environmental pollution, bodily injury, or damage to any assets.	Probe and Rear Panel, China Rating Plate
	When closing the LCD cover, use caution to avoid injuring hands or fingers as there is a closing mechanism which allows the LCD cover to automatically close.	Bottom
	Do not connect the DVD-RW to the system while scanning. The DVD-RW can be used when connecting to the Docking Cart.	DVD-RW
 ME20	GOST symbol: Russia Regulatory Country Clearance.	Bottom
	This product consists of devices that may contain mercury, which must be recycled or disposed of in accordance with local, state, or country laws. (Within this system, the backlight lamps in the monitor display, contain mercury.)	Bottom

Label Icon Description (continued)

Classifications

Type of protection against electric shock

- Class I Equipment
 - LOGIQ e Console with AC Adapter (*1)
 - Docking Cart Console

Degree of protection against electric shock

- Type BF Applied part (*2) (for Probes marked with BF symbol)
- Type CF Applied part (*3) (for ECG marked with CF symbol)

Continuous OperationSystem is Ordinary Equipment (IPX0)Footswitch is IPX8 (FSU-1000, MKF 2-MED GP26)

*1. Class I Equipment

EQUIPMENT in which protection against electric shock does not rely on BASIC INSULATION only, but includes a protective earth ground. This additional safety precaution prevents exposed metal parts from becoming LIVE in the event of an insulation failure.

*2. Type BF Applied Part

TYPE BF APPLIED PART providing a specified degree of protection against electric shock, with particular regard to allowable LEAKAGE CURRENT.

Table 4-3: Type BF Equipment

	Normal Mode	Single fault condition
Patient leakage current	Less than 100 microA	Less than 500 microA

*3. Type CF Applied Part

TYPE CF APPLIED PART providing a degree of protection higher than that for Type BF Applied Part against electric shock particularly regarding allowable LEAKAGE CURRENTS.

Table 4-4: Type CF Equipment

	Normal Mode	Single fault condition
Patient leakage current	Less than 10 microA	Less than 50 microA

4-18

LOGIQ e User Guide
Direction 5314626-100 Rev. 3

EMC (Electromagnetic Compatibility)

NOTE: *This equipment generates, uses and can radiate radio frequency energy. The equipment may cause radio frequency interference to other medical and non-medical devices and radio communications. To provide reasonable protection against such interference, this product complies with emissions limits for a Group 1, Class A Medical Devices Directive as stated in EN 60601-1-2. However, there is no guarantee that interference will not occur in a particular installation.*

NOTE: *If this equipment is found to cause interference (which may be determined by turning the equipment on and off), the user (or qualified service personnel) should attempt to correct the problem by one or more of the following measure(s):*

- *reorient or relocate the affected device(s)*
- *increase the separation between the equipment and the affected device*
- *power the equipment from a source different from that of the affected device*
- *consult the point of purchase or service representative for further suggestions.*

NOTE: *The manufacturer is not responsible for any interference caused by using other than recommended interconnect cables or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the users' authority to operate the equipment.*

NOTE: *To comply with the regulations on electromagnetic interference for a Class A FCC Device, all interconnect cables to peripheral devices must be shielded and properly grounded. Use of cables not properly shielded and grounded may result in the equipment causing radio frequency interference in violation of the FCC regulations.*

EMC Performance

All types of electronic equipment may characteristically cause electromagnetic interference with other equipment, either transmitted through air or connecting cables. The term EMC (Electromagnetic Compatibility) indicates the capability of equipment to curb electromagnetic influence from other equipment and at the same time not affect other equipment with similar electromagnetic radiation from itself.

EMC Performance (continued)

Proper installation following the service manual is required in order to achieve the full EMC performance of the product.

The product must be installed as stipulated in 4.2, Notice upon Installation of Product.

In case of issues related to EMC, please call your service personnel.

The manufacturer is not responsible for any interference caused by using other than recommended interconnect cables or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the users' authority to operate the equipment.



Do not use devices which intentionally transmit RF signals (cellular phones, transceivers, or radio controlled products), other than those supplied by GE (wireless microphone, broadband over power lines, for example) unless intended for use with this system, in the vicinity of this equipment as it may cause performance outside the published specifications.

Keep power to these devices turned off when near this equipment.

Medical staff in charge of this equipment is required to instruct technicians, patients and other people who may be around this equipment to fully comply with the above regulation.

EMC Performance (continued)

Portable and mobile radio communications equipment (e.g. two-way radio, cellular/cordless telephones and similar equipment) should be used no closer to any part of this system, including cables, than determined according to the following method:

Notice upon Installation of Product

Separation distance and effect from fixed radio communications equipment: field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast, and TV broadcast transmitter cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the ultrasound system is used exceeds the applicable RF compliance level as stated in the immunity declaration, the ultrasound system should be observed to verify normal operation. If abnormal operation is observed, additional measures may be necessary, such as re-orienting or relocating the ultrasound system or using an RF shielded examination room may be necessary.

1. Use either power supply cords provided by GE Medical Systems or ones designated by GE Medical Systems. Products equipped with a power source plug should be plugged into the fixed power socket which has the protective grounding conductor. Never use any adaptor or converter to connect with a power source plug (e.g. three-prong-to-two-prong converter).
2. Locate the equipment as far away as possible from other electronic equipment.
3. Be sure to use only the cables provided by or designated by GE Medical Systems. Connect these cables following the installation procedures (e.g. wire power cables separately from signal cables).
4. Lay out the main equipment and other peripherals following the installation procedures described in the Option Installation manuals.

General Notice

1. Designation of Peripheral Equipment Connectable to This Product.

The equipment indicated in Chapter 18 can be hooked up to the product without compromising its EMC performance.

Avoid using equipment not designated in the list. Failure to comply with this instruction may result in poor EMC performance of the product.

2. Notice against User Modification

The user should never modify this product. User modifications may cause degradation in EMC performance.

Modification of the product includes changes in:

- a. Cables (length, material, wiring, etc.)
- b. System installation/layout
- c. System configuration/components
- d. Securing system parts (cover open/close, cover screwing)

Peripheral Update for EC countries

Peripheral used in the patient environment

The following is intended to provide the users in EC countries with updated information concerning the connection of the LOGIQ e to image recording and other devices or communication networks.

The LOGIQ e has been verified for overall safety, compatibility and compliance with the following on-board image recording devices:

- Sony UP-D897 B/W Printer
- Sony UP-D25MD Color Printer

The LOGIQ e may also be used safely while connected to devices other than those recommended above if the devices and their specifications, installation, and interconnection with the system conform to the requirements of IEC/EN 60601-1-1.



The connection of equipment or transmission networks other than as specified in the user instructions can result in an electric shock hazard or equipment malfunction. Substitute or alternate equipment and connections requires verification of compatibility and conformity to IEC/EN 60601-1-1 by the installer. Equipment modifications and possible resulting malfunctions and electromagnetic interference are the responsibility of the owner.

General precautions for installing an alternate off-board, remote device or a network would include:

1. The added device(s) must have appropriate safety standard conformance and CE Marking.
2. There must be adequate mechanical mounting of the device and stability of the combination.
3. Risk and leakage current of the combination must comply with IEC/EN 60601-1-1.
4. Electromagnetic emissions and immunity of the combination must conform to IEC/EN 60601-1-2.

Peripheral Update for EC countries (continued)

Peripheral used in the non-patient environment

The LOGIQ e has also been verified for compatibility, and compliance for connection to a local area network (LAN) via a wireless LAN, provided the LAN components are IEC/EN 60950 compliant.

The LOGIQ e has also been verified for compatibility, and compliance for connection to a DVD-RW via the system USB port, provided the DVD-RW is IEC/EN 60950 compliant.

General precautions for installing an alternate off-board, remote device or a network would include:

1. The added device(s) must have appropriate safety standard conformance and CE Marking.
2. The added device(s) must be used for their intended purpose having a compatible interface.

Declaration of Emissions

This system is suitable for use in the following environment. The user must assure that it is used only in the electromagnetic environment as specified.

Table 4-5: Declaration of Emissions

Guidance and manufacturer’s declaration - electromagnetic emissions		
The system is intended for use in the electromagnetic environment specified below. The user of the system should assure that it is used in such an environment.		
Emission Type	Compliance	Electromagnetic Environment
RF Emissions CISPR 11	Group 1	This system uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF Emissions CISPR 11	Class A	This system is suitable for use in all establishments, other than domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes, provided the following warning is heeded: WARNING: This system is intended for use by healthcare professionals only. This system may cause radio interference or may disrupt the operation of nearby equipment. It may be necessary to take mitigation measures, such as re-orienting or relocating the system or shielding the location.
Harmonic Emissions IEC 61000-3-2	Class A	
Voltage Fluctuations/Flicker Emissions IEC 61000-3-3	Complies	

Declaration of Immunity

This system is suitable for use in the following environment. The user must assure that the system is used according to the specified guidance and only in the electromagnetic environment listed.

Table 4-6: Declaration of Immunity

Immunity Type	Equipment Capability	Regulatory Acceptable Level	EMC Environment and Guidance
IEC 61000-4-2 Static discharge (ESD)	± 6 kV contact ± 8 kV air	± 6 kV contact ± 8 kV air	Floors should be wood, concrete, or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%. Mains power quality should be that of a typical commercial and/or hospital environment. If the user requires continued operation during power mains interruptions, it is recommended that the system be powered from a UPS or a battery. NOTE: UT is the a.c. mains voltage prior to application of the test level. Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial and/or hospital environment. Separation distance to radio communication equipment must be maintained according to the method below. Interference may occur in the vicinity of equipment marked with the symbol:  Image degradation or interference may occur due to conducted RF noise on the equipment mains power supply or other signal cable. Such interference is easily recognized and distinguishable from patient anatomy and physiological waveforms. Interference of this type may delay the examination without affecting diagnostic accuracy. Additional mains/signal RF isolation or filtering may be needed if this type interference occurs frequently.
IEC 61000-4-4 Electrical fast transient/burst	± 2 kV for mains ± 1 kV for SIP/ SOP	± 2 kV for mains ± 1 kV for SIP/SOP	
IEC 61000-4-5 Surge Immunity	± 1 kV differential ± 2 kV common	± 1 kV differential ± 2 kV common	
IEC 61000-4-11 Voltage dips, short interruptions and voltage variations on mains supply	< 50 _T (> 95% dip) for 0.5 cycle; 400 _T (60 0ip) for 5 cycles; 700 _T (30 0ip) for 25 cycles; < 50 _T (>95% dip) for 5 sec	< 50 _T (> 95% dip) for 0.5 cycle; 400 _T (60 0ip) for 5 cycles; 700 _T (30 0ip) for 25 cycles; < 50 _T (>95% dip) for 5 sec	
IEC 61000-4-8 Power frequency (50/ 60 Hz) magnetic field	3 A/m	3 A/m	
IEC 61000-4-6 Conducted RF	3 V _{RMS} 150 kHz - 80 MHz	3 V _{RMS} 150 kHz - 80 MHz	
IEC 61000-4-3 Radiated RF	3 V/m 80 MHz - 2.5 GHz	3 V/m 80 MHz - 2.5 GHz	
NOTE: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people. If noise generated from other electronic equipment is near the probe's center frequency, noise may appear on the image. Good power line isolation is required.			

Patient Environmental Devices



Figure 4-4. Patient Environmental Devices

1. Left side:
 - 2 USB Ports—Peripheral devices, Printers (Color and USB), Memory Stick, Footswitch, Wireless LAN Adapter, USB Hub, ECG, USB HDD
 - 1 Earphone Port
2. Bottom side: Lithium-ion battery port
3. Right side: Probe port, Security lock
4. Rear panel:
 - 1 VGA Port.
 - 1 Network Port
 - 1 Docking Port

Acceptable Devices

The Patient Environmental devices shown on the previous page are specified to be suitable for use within the PATIENT ENVIRONMENT.



DO NOT connect any probes or accessories without approval by GE within the PATIENT ENVIRONMENT.

See 'Peripheral Update for EC countries' on *page 4-24 for more information.*

Unapproved Devices



DO NOT use unapproved devices.

If devices are connected without the approval of GE, the warranty will be INVALID.

Any device connected to the LOGIQ e must conform to one or more of the requirements listed below:

1. IEC standard or equivalent standards appropriate to devices.
2. The devices shall be connected to PROTECTIVE EARTH (GROUND).

Accessories, Options, Supplies



Unsafe operation or malfunction may result. Use only the accessories, options and supplies approved or recommended in these instructions for use.

Acoustic Output

Located on the upper right section of the system display monitor, the acoustic output display provides the operator with real-time indication of acoustic levels being generated by the system. See the *Acoustic Output chapter* in the *Advanced Reference Manual* for more information. This display is based on NEMA/AIUM Standards for Real-time Display of Thermal and Mechanic Acoustic Output Indices on Diagnostic Ultrasound Equipment.

Acoustic Output Display Specifications

The display consists of three parts: Thermal Index (TI), Mechanical Index (MI), and a relative Acoustic Output (AO) value. Although not part of the NEMA/AIUM standard, the AO value informs the user of where the system is operating within the range of available output.

The TI and MI are displayed at all times. The TI display starts at a value of 0.0 and increments in steps of 0.1. The MI display values between 0 and 0.4 increment in steps of 0.01 and for values greater than 0.4, increments in steps of 0.1.

Thermal Index

Depending on the examination and type of tissue involved, the TI parameter will be one of three types:

- **Soft Tissue Thermal Index (TIS).** Used when imaging soft tissue only, it provides an estimate of potential temperature increase in soft tissue.
- **Bone Thermal Index (TIB).** Used when bone is near the focus of the image as in the third trimester OB examination, it provides an estimate of potential temperature increase in the bone or adjacent soft tissue.
- **Cranial Bone Thermal Index (TIC).** Used when bone is near the skin surface as in transcranial examination, it provides an estimate of potential temperature increase in the bone or adjacent soft tissue.

Acoustic Output Display Specifications (continued)

Mechanical Index	MI recognizes the importance of non-thermal processes, cavitation in particular, and the Index is an attempt to indicate the probability that they might occur within the tissue.
Changing the Thermal Index Type	You can select the displayed TI type on Utility -> Imaging -> B-Mode. This preset is application dependent so each application could specify a different TI type. Display precision is ± 0.1 and accuracy is $\pm 50\%$. Accuracy of the power output displayed value on the Top/Sub Menu is $\pm 2\%$ in B- and M-Modes and $\pm 10\%$ in all other modes.

Controls Affecting Acoustic Output

The potential for producing mechanical bioeffects (MI) or thermal bioeffects (TI) can be influenced by certain controls.

Direct. The Acoustic Output control has the most significant effect on Acoustic Output.

Indirect. Indirect effects may occur when adjusting controls. Controls that can influence MI and TI are detailed under the Bioeffects portion of each control in the Optimizing the Image chapter.

Always observe the Acoustic Output display for possible effects.

Best practices while scanning



HINTS

Raise the Acoustic Output only after attempting image optimization with controls that have no effect on Acoustic Output, such as Gain and TGC.

NOTE: *Refer to the sections in Chapter 5 for a complete discussion of each control.*



WARNING

Be sure to have read and understood control explanations for each mode used before attempting to adjust the Acoustic Output control or any control that can effect Acoustic Output.



Acoustic Output Hazard

Use the minimum necessary acoustic output to get the best diagnostic image or measurement during an examination. Begin the exam with the probe that provides an optimum focal depth and penetration.

Acoustic Output Default Levels

In order to assure that an exam does not start at a high output level, the LOGIQ e initiates scanning at a reduced default output level. This reduced level is preset programmable and depends upon the exam category and probe selected. It takes effect when the system is powered on or **New Patient** is selected.

To modify acoustic output, adjust the Power Output level on the Top/Sub Menu.

Warning Label Locations

LOGIQ e warning labels are provided in English.

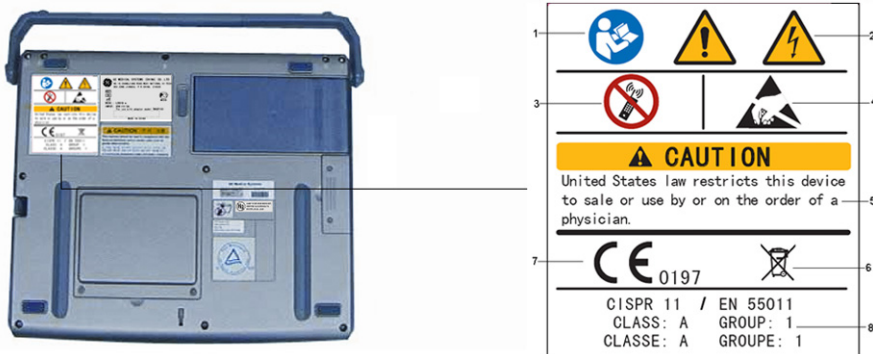


Figure 4-5. Label location

1. "Consult accompanying document" is intended to alert the user to refer to the operator manual or other instructions when complete information cannot be provided on the label.
2. Possible shock hazard. Do not remove covers or panels. No user serviceable parts are inside. Refer servicing to qualified service personnel.
3. Do not use the following devices near this equipment: cellular phone, radio receiver, mobile radio transmitter, radio controlled toy, etc. Use of these devices near this equipment could cause this equipment to perform outside the published specifications. Keep power to these devices turned off when near this equipment.
4. Be careful of static
5. Prescription Device (For U.S.A. Only)
6. WEEE Label
7. The CE Mark of Conformity indicates this equipment conforms with the Council Directive 93/42/EEC.
8. CISPR **CAUTION:** The LOGIQ e conforms to the CISPR11, Group 1, Class A of the international standard for Electromagnetic disturbance characteristics.

Warning Label Locations (continued)



Figure 4-6. Docking Cart Rating Plate

Warning Label Locations (continued)

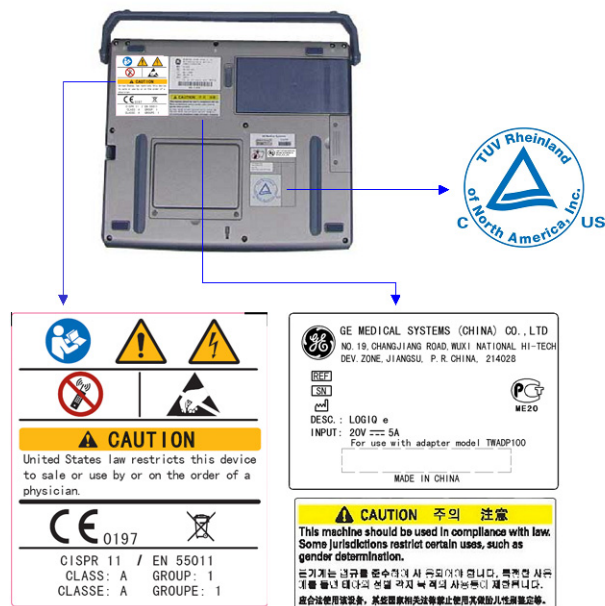


Figure 4-7. LOGIQ e R5.2.x TUV and Identification/Rating Plate Label Location

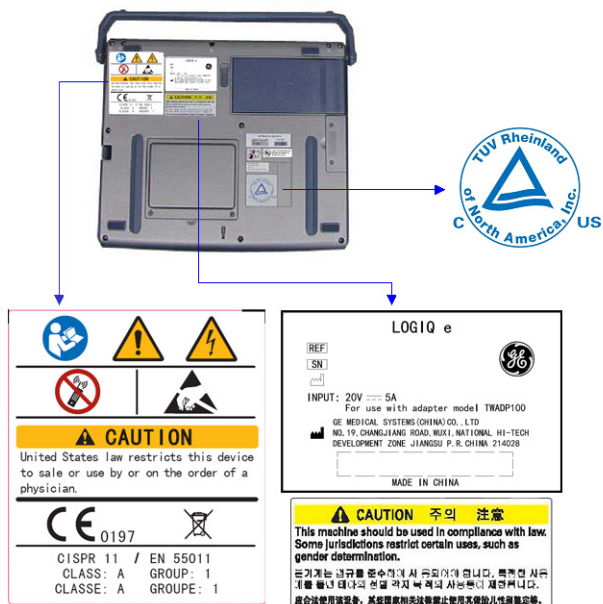
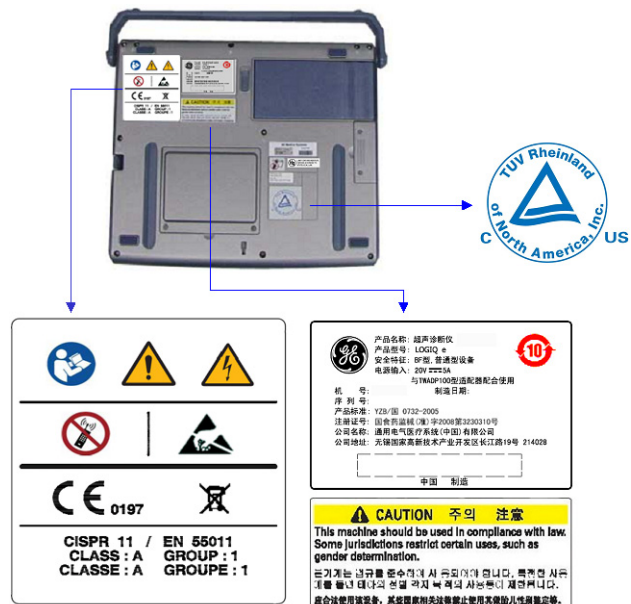
Table 4-7: Rating Plate Explanations

	Date of manufacture: The date could be a year, year and month, or year, month and day, as appropriate. See ISO 8601 for date formats.
	Catalog or model number
	Serial number
	Direct Current: For products to be powered from a DC supply
	Input

Table 4-7: Rating Plate Explanations

For use with adapter model TWADP100	For use with adapter model TWADP100
DESC.	Description

Warning Label Locations (continued)



Warning Label Locations (continued)

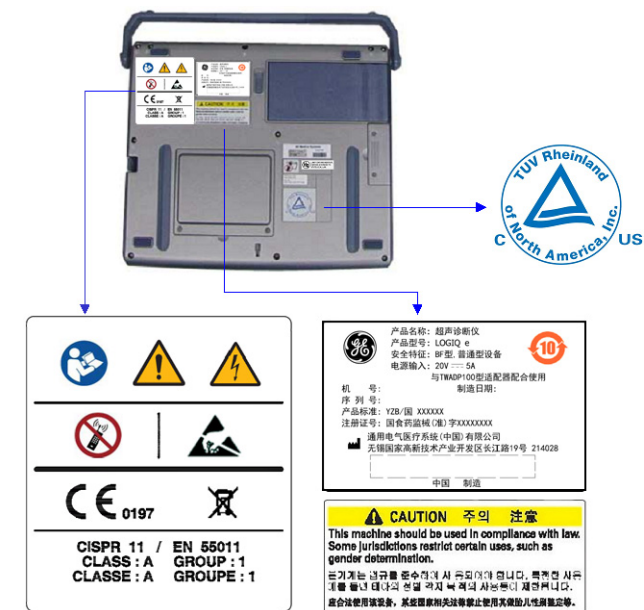


Figure 4-10. LOGIQ e R6.x.x Rating Plate (China only)

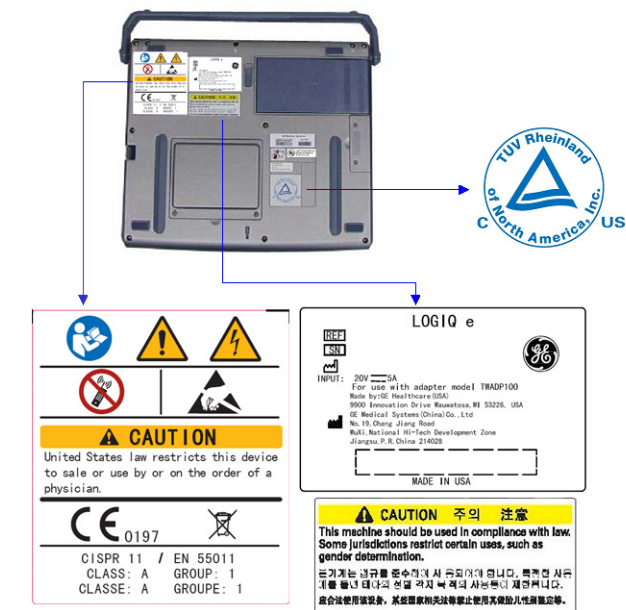


Figure 4-11. LOGIQ e Rating Plate (CKD version)

Warning Label Locations (continued)



Figure 4-12. AC Adapter Label

Warning Label Locations (continued)

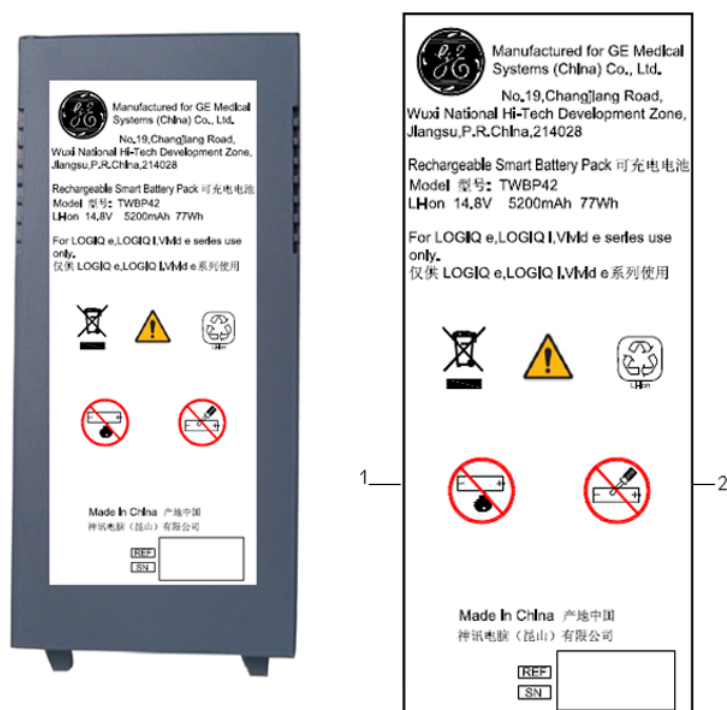


Figure 4-13. Battery Label

1. Do not put the battery in fire.
2. Do not disassemble or mistreat the battery.



Do not disassemble or mistreat the battery. Do not put the battery in fire. Replace the battery with the same battery type only. Failure to follow these instructions may present risk of explosion fire or high temperature. See the battery user manual for additional safety instructions.

Chapter 5

Emergency Department (ED)

*Describes the LOGIQ e system for use in the
Emergency Department.*

Beginning an Exam

Introduction

You optimize the image on the LOGIQ e Emergency Department system by adjusting the **Depth** (with Auto Focus Zone and Frequency) control. Further optimization should not be required though manual adjustment is allowed.

'ED' appears on the lower right and corner of the display screen.

Starting a New Patient

Press **Patient**.

GE Healthcare

Patient ID: Last Name: DOB:
First Name: Age:
Middle Name: Sex: ☐ female ☐ male

ABD OB GYN CARD VAS SM P PED

Height: cm Accession #:
Weight: kg Exam Description:
BSA: m^2 Operator: ADM
Ref. Physician:

Images Clear

Patient View

Search key: Patient ID string: Clear Hide

Patient ID	Last Name	First Name	Birthdate	Sex	Last Exam	Img. size
------------	-----------	------------	-----------	-----	-----------	-----------

Review New Exam Delete Lock Show: All 0 / 0

27/03/07 18:01:51 start

Figure 5-1. ED Patient Screen

Refer to *Beginning an Exam* in Chapter 2.

Optimizing the Image

B-Mode

Intended Uses

B-Mode is intended to provide two-dimensional images and measurement capabilities concerning the anatomical structure of soft tissue.



Figure 5-2. B-Mode Display

B-Mode Top/Sub Menu

Adjust the image by using the **Depth** control. If additional functionality is needed, the following Top/Sub Menu controls are available.

See Chapter 2 for more details on these controls.

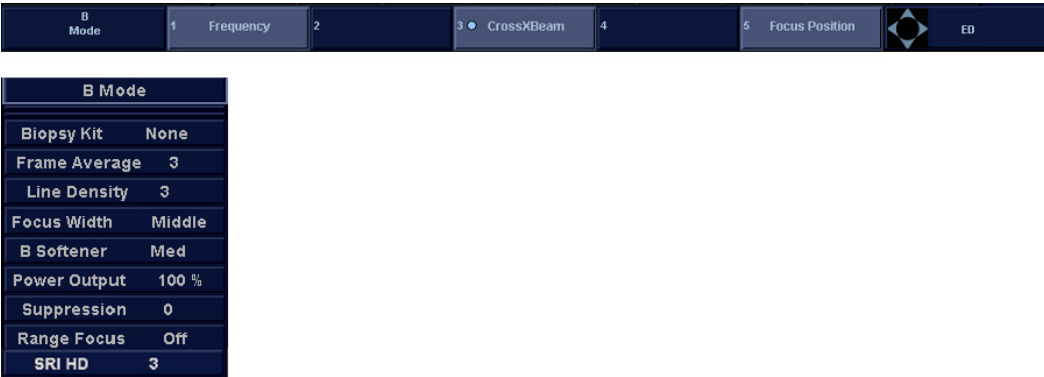


Figure 5-3. B-Mode Top/Sub Menu

M-Mode

Intended Use

M-Mode is intended to provide a display format and measurement capability that represents tissue displacement (motion) occurring over time along a single vector.

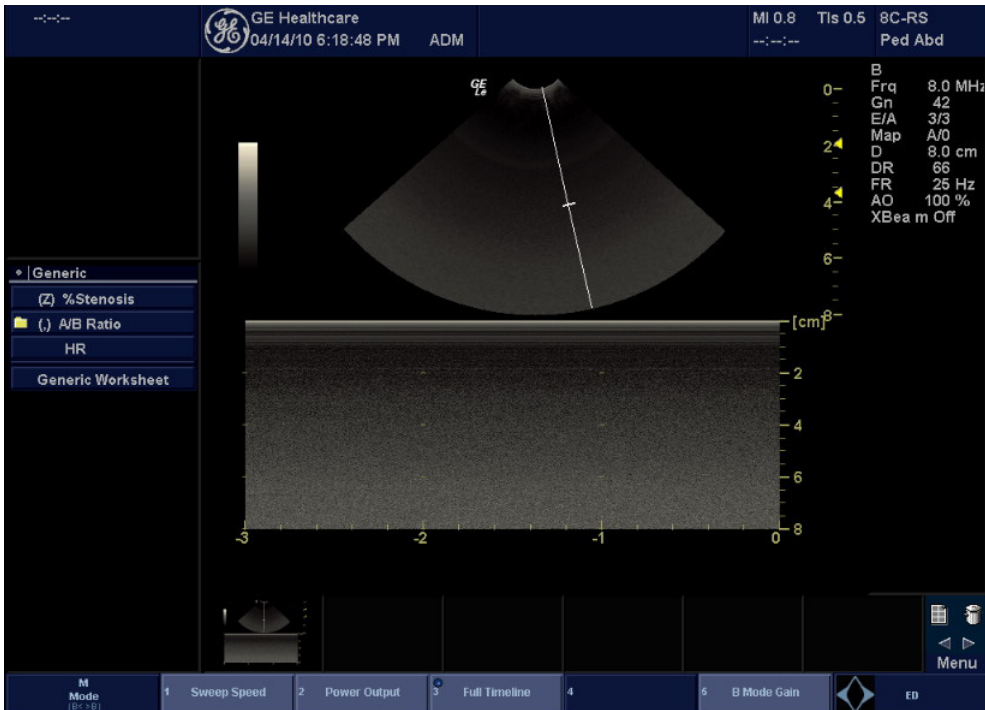


Figure 5-4. M-Mode Top/Sub Menu

M-Mode Top/Sub Menu

The following Top/Sub Menu controls are available for functionality adjustment and image optimization.
See Chapter 2 for more details on these controls.



Figure 5-5. M-Mode Top/Sub Menu

Color Flow (CF) Mode

Intended Use

Color Flow Mode is a Doppler Mode intended to add color-coded qualitative information concerning the relative velocity and direction of fluid motion within the B-Mode image.

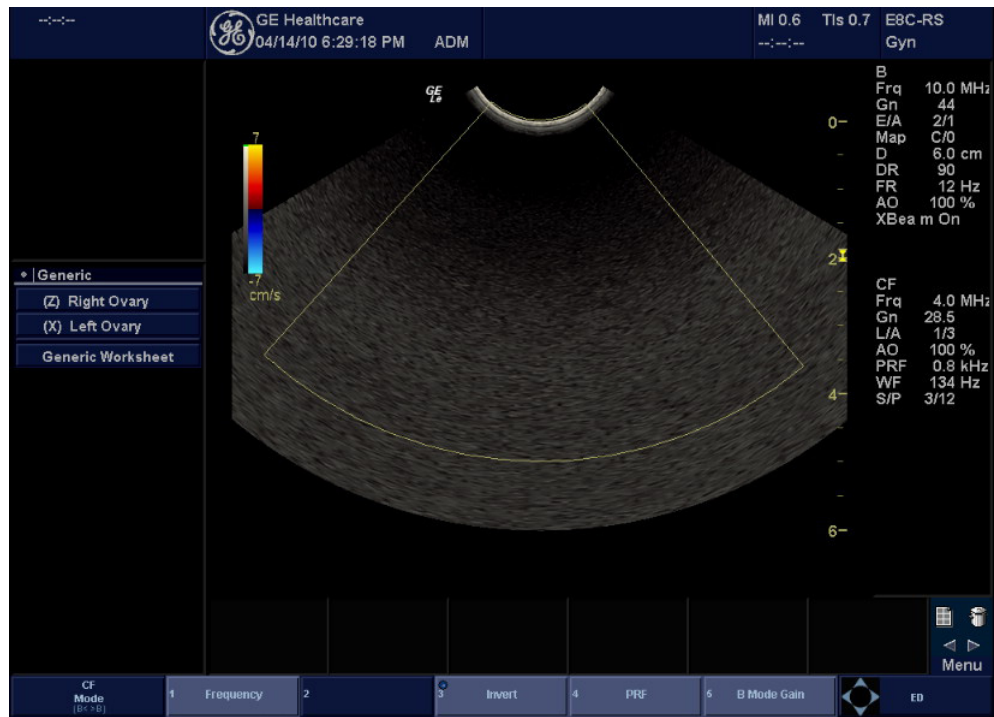


Figure 5-6. Color Flow Mode Display

CF-Mode Top/Sub Menu

The following Top/Sub Menu controls are available for functionality adjustment and image optimization.

See Chapter 2 for more details on these controls.

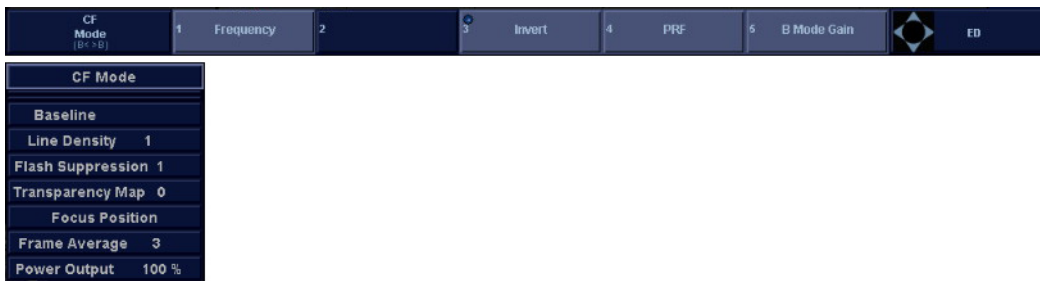


Figure 5-7. CF-Mode Top/Sub Menu

Power Doppler Imaging (PDI) Mode

Intended Uses

Power Doppler Imaging (PDI) is a color flow mapping technique used to map the strength of the Doppler signal coming from the flow rather than the frequency shift of the signal. Using this technique, the ultrasound system plots color flow based on the number of reflectors that are moving, regardless of their velocity. PDI does not map velocity, therefore it is not subject to aliasing.

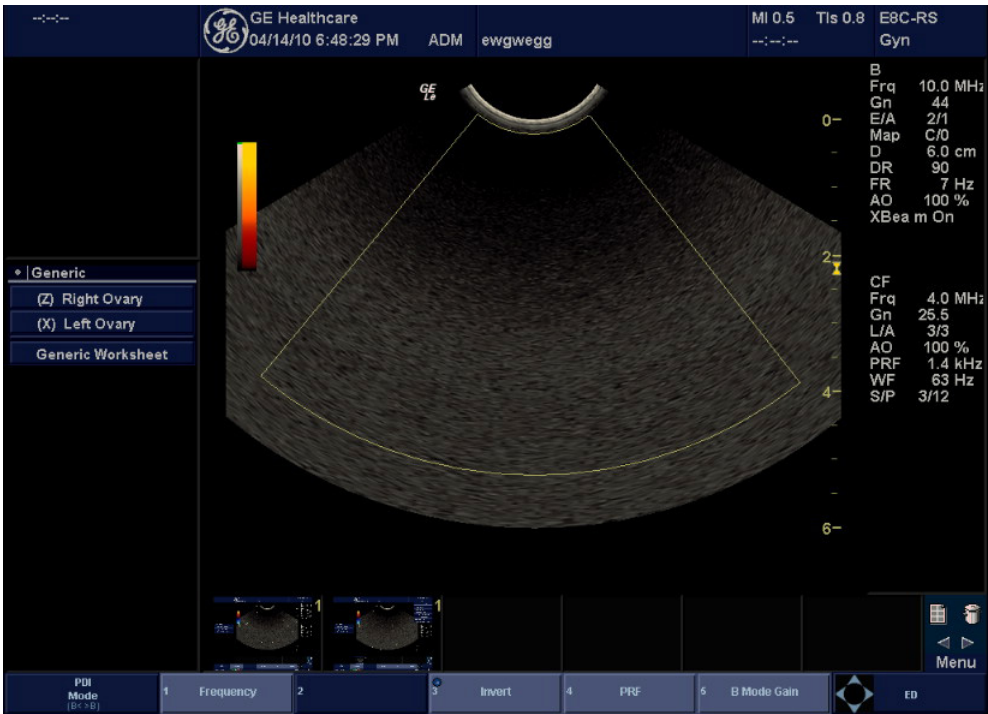


Figure 5-8. Power Doppler Imaging Display

PDI Top/Sub Menu

The following Top/Sub Menu controls are available for functionality adjustment and image optimization.

See Chapter 2 for more details on these controls.

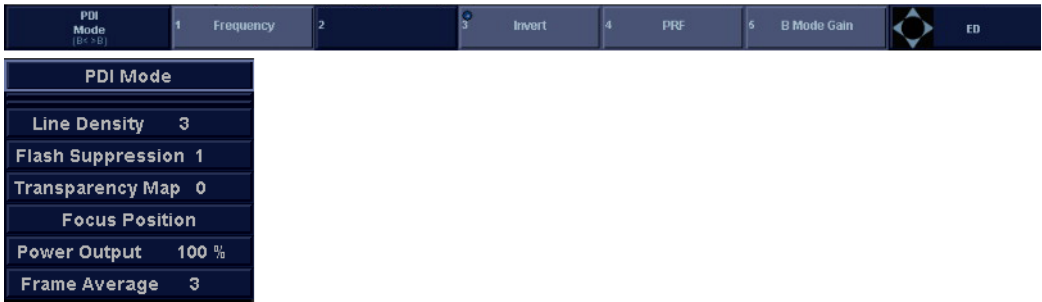


Figure 5-9. PDI Top/Sub Menu

M Color Flow Mode

Intended Uses

M Color Flow is used for fetal cardiac applications. Color Flow overlays color on the M-Mode image using velocity and variance color maps. The Color Flow wedge overlays the B-Mode image and M-Mode timeline.

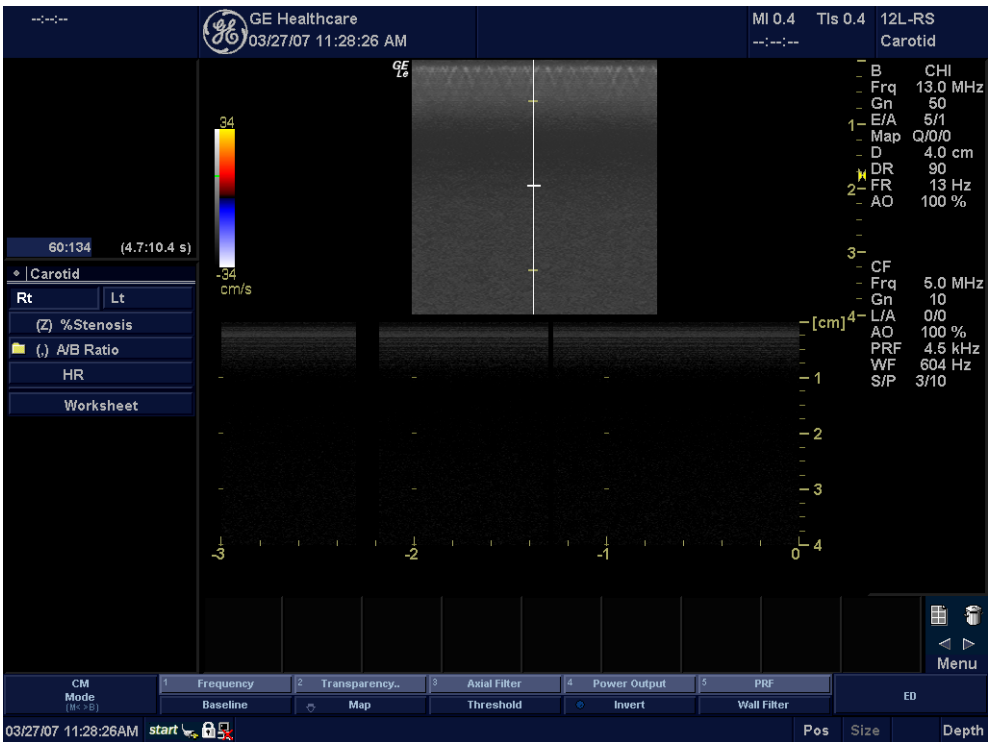


Figure 5-10. M Color Flow Display

M Color Flow Top/Sub Menu

The following Top/Sub Menu controls are available for functionality adjustment and image optimization.

See Chapter 2 for more details on these controls.

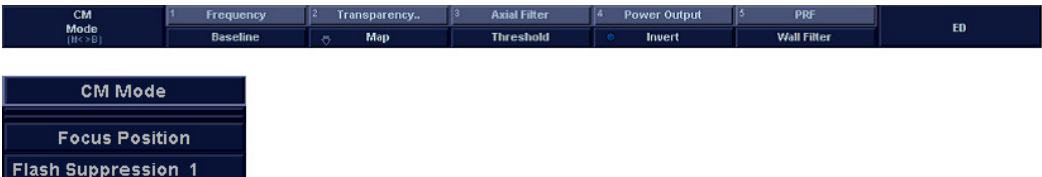


Figure 5-11. M Color Flow Top/Sub Menu

Pulsed Wave (PW) Doppler Mode

Intended Use

Doppler is intended to provide measurement data concerning the velocity of moving tissues and fluids. PW Doppler lets you examine blood flow data selectively from a small region called the sample volume.

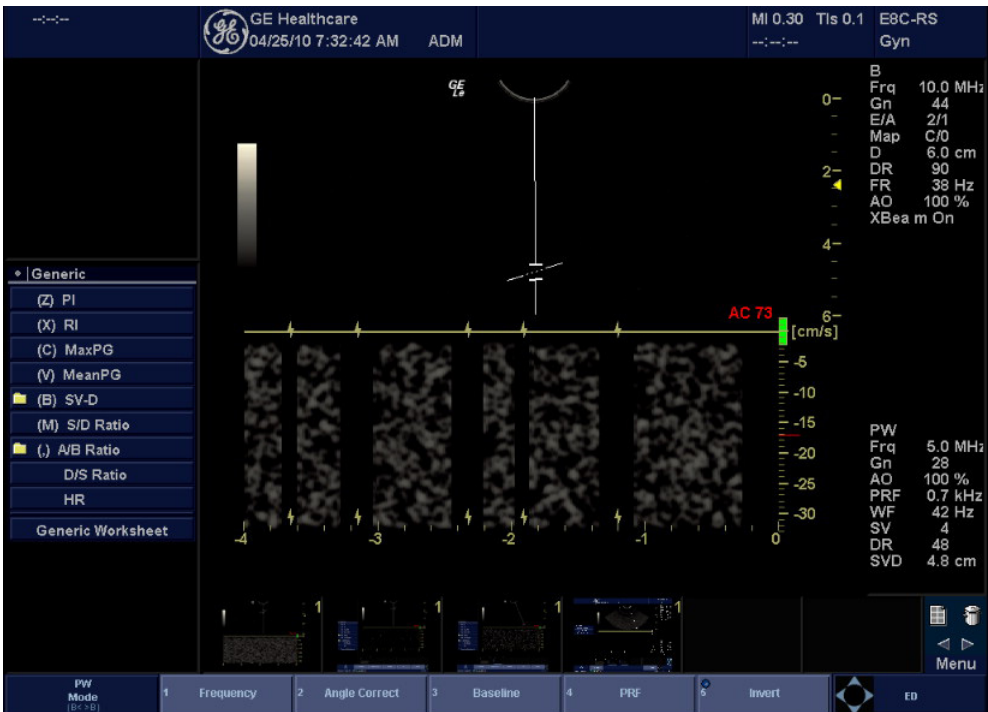


Figure 5-12. Doppler Mode Display

PW Doppler Mode Top/Sub Menu

The following Top/Sub Menu controls are available for functionality adjustment and image optimization.

See Chapter 2 for more details on these controls.

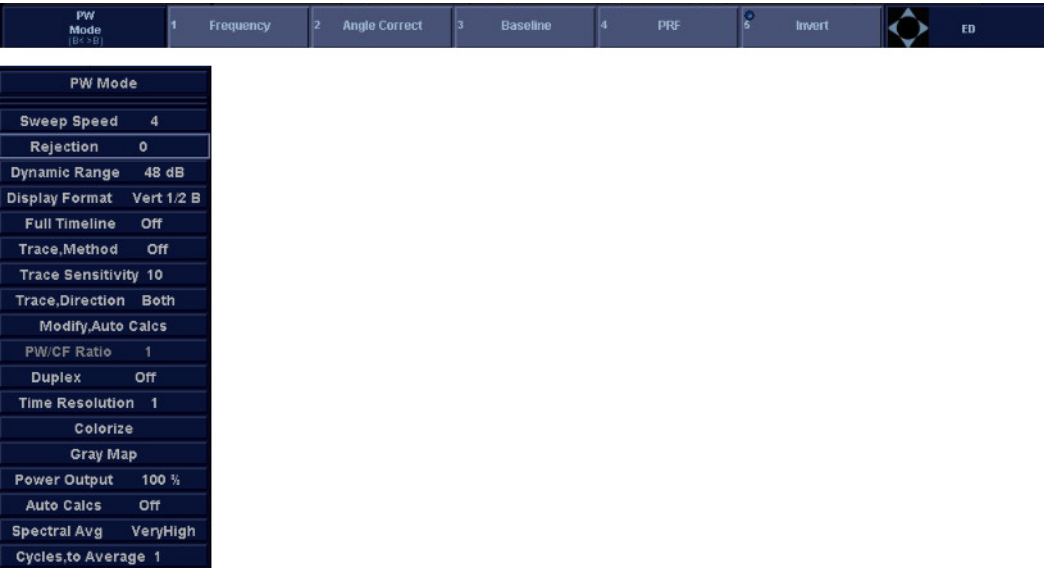


Figure 5-13. PW Doppler Mode Top/Sub Menu

Chapter 6

Nerve Block

Describes the LOGIQ e system for use in regional anesthesia guidance.

Beginning an Exam

Introduction

You optimize the image on the LOGIQ e Nerve Block system, adjust the image by adjusting the **Depth** (with Auto Focus Zone and Frequency) control. Further optimization should not be required though manual adjustment is allowed.

'NERVE' appears on the lower right and corner of the display screen.

Starting a New Patient

Press **Patient**.

GE Healthcare

Patient ID: Last Name: DOB:
First Name: Age:
Middle Name: Sex: ☐ female ☐ male

Nerve Blocks VAS CARD

Accession #:
Exam Description:
Operator: ADM
Ref. Physician:

Superficial Average Deep Images Clear

Patient View

Search key: Patient ID string: Clear Hide

Patient ID	Last Name	First Name	Birthdate	Sex	Last Exam	Img. size
------------	-----------	------------	-----------	-----	-----------	-----------

Review New Exam Delete Lock Show: All 0 / 0

27/03/07 18:13:03 start

Figure 6-1. Nerve Block Patient Screen

Refer to *Beginning an Exam* in Chapter 2.

Selecting an Application Preset and a Probe

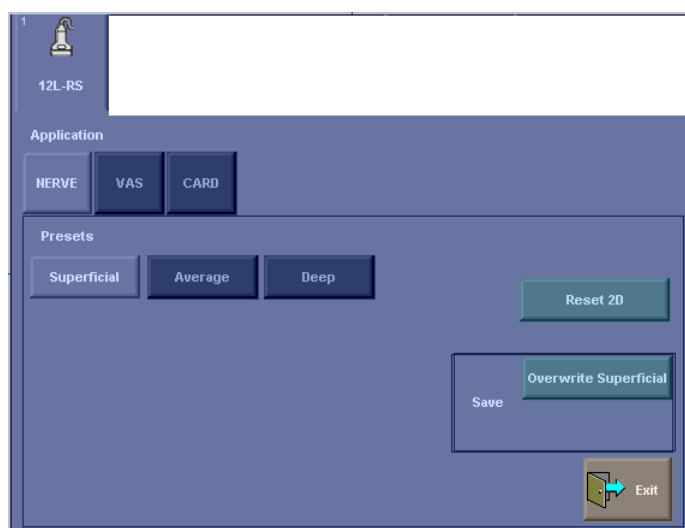


Figure 6-2. Nerve Application Preset

Optimizing the Image

B-Mode

Intended Uses

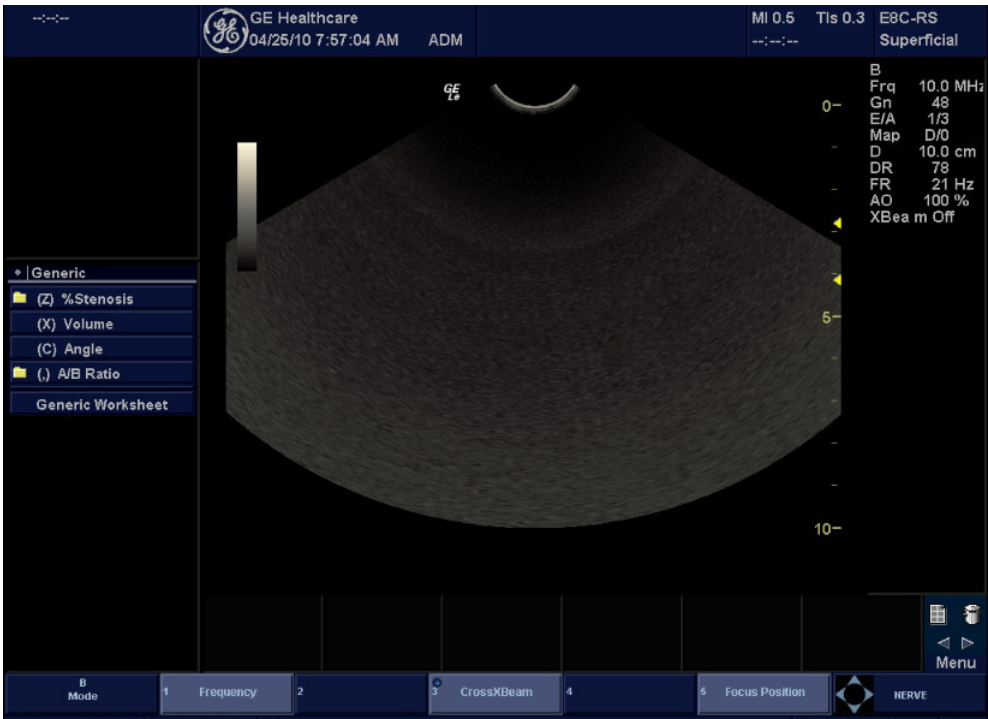


Figure 6-3. B-Mode Display

B-Mode Top/Sub Menu

Adjust the image by using the **Depth** control. If additional functionality is needed, the following Top/Sub Menu controls are available.

See Chapter 2 for more details on these controls.

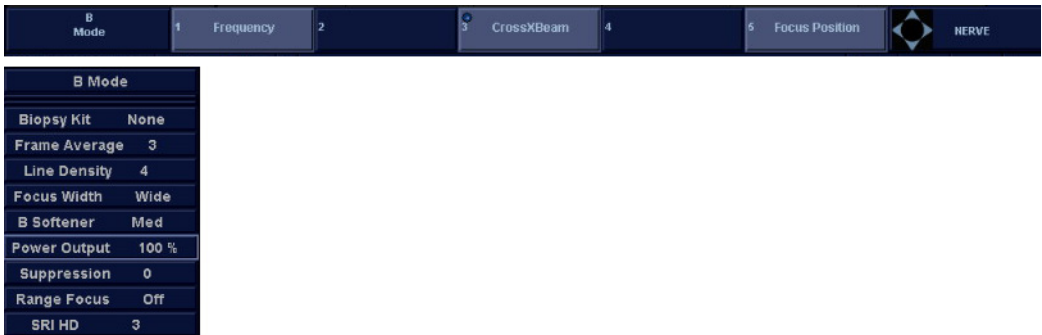


Figure 6-4. B-Mode Top/Sub Menu

Color Flow (CF) Mode

Intended Uses

Color Flow Mode is a Doppler Mode intended to add color-coded qualitative information concerning the relative velocity and direction of fluid motion within the B-Mode image.

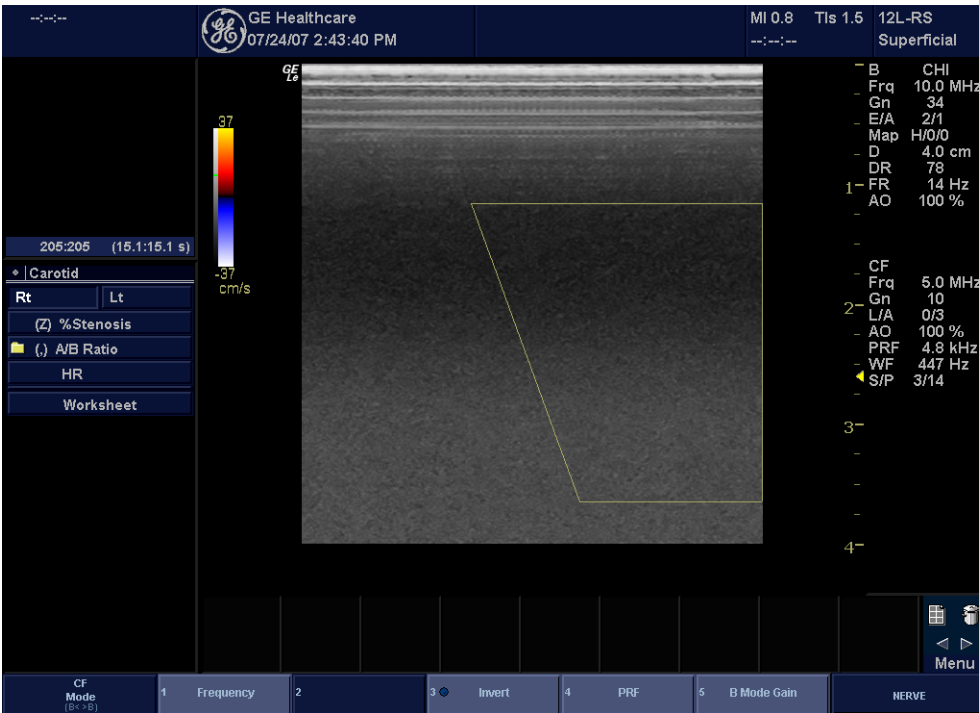


Figure 6-5. Color Flow Mode Display

CF-Mode Top/Sub Menu

The following Top/Sub Menu controls are available for functionality adjustment and image optimization.

See Chapter 2 for more details on these controls.

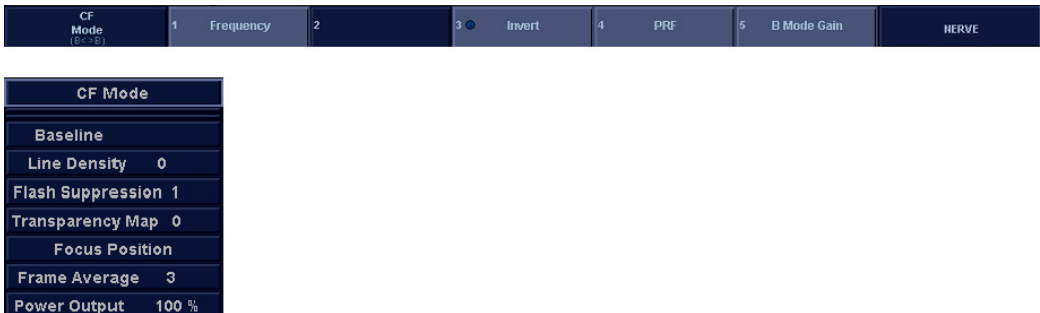


Figure 6-6. CF-Mode Top/Sub Menu

Power Doppler Imaging (PDI) Mode

Intended Uses

Power Doppler Imaging (PDI) is a color flow mapping technique used to map the strength of the Doppler signal coming from the flow rather than the frequency shift of the signal. Using this technique, the ultrasound system plots color flow based on the number of reflectors that are moving, regardless of their velocity. PDI does not map velocity, therefore it is not subject to aliasing.

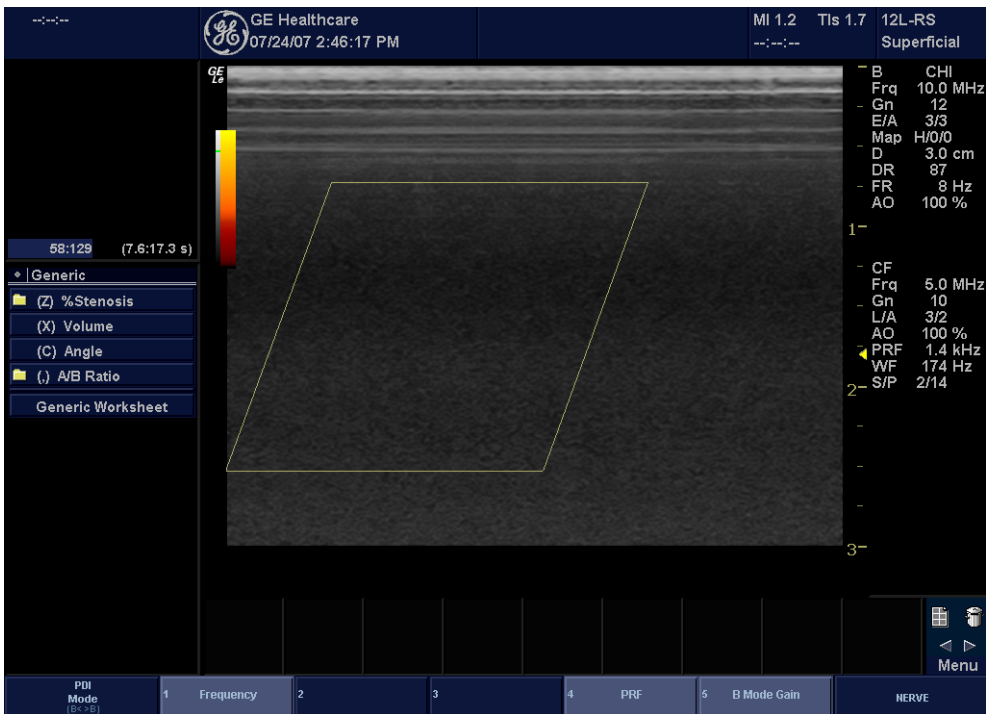


Figure 6-7. Power Doppler Imaging Display

PDI Top/Sub Menu

The following Top/Sub Menu controls are available for functionality adjustment and image optimization.

See Chapter 2 for more details on these controls.



Figure 6-8. PDI Top/Sub Menu

Pulsed Wave (PW) Doppler Mode

Intended Use

Doppler is intended to provide measurement data concerning the velocity of moving tissues and fluids. PW Doppler lets you examine blood flow data selectively from a small region called the sample volume.



Figure 6-9. Doppler Mode Display

PW Doppler Mode Top/Sub Menu

The following Top/Sub Menu controls are available for functionality adjustment and image optimization.

See Chapter 2 for more details on these controls.

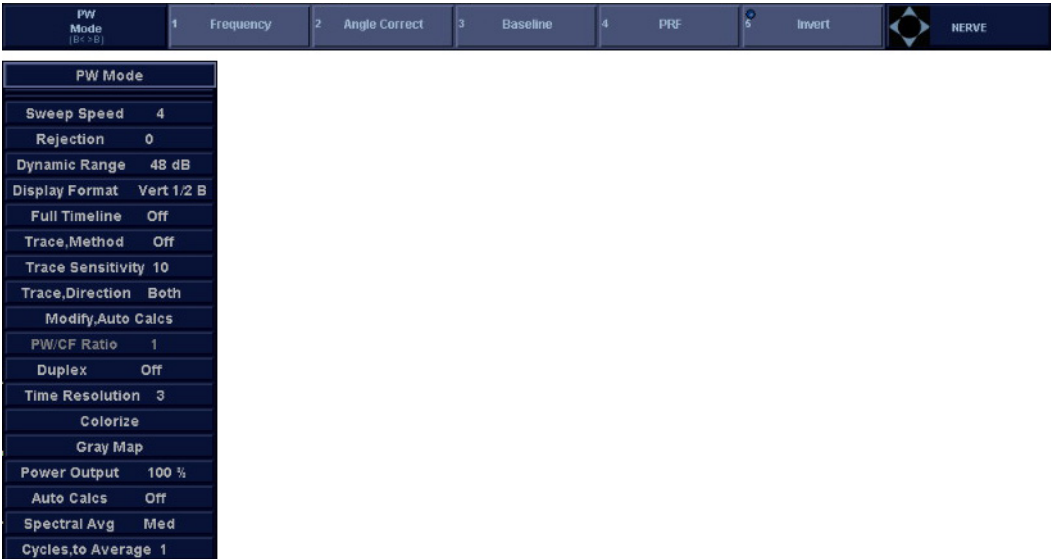


Figure 6-10. PW Doppler Mode Top/Sub Menu

Chapter 7

Using Touch Screen

Describes the use of the Touch Screen with the LOGIQ e system.

Beginning an Exam

Introduction

Activate/Deactivate Touch Screen mode by pressing **F12**.

NOTE: All the function keys except F12, Cursor, Set/B Pause, Power Key and keyboard of LOGIQ e will be disabled if Touch Screen mode is activated.

NOTE: Pressing the Power key automatically deactivates the Touch Screen Mode.

NOTE: Always use fingers or gloved fingers to operate on the Touch Screen, improper use may cause damage to the monitor.

NOTE: It is recommended to close the LOGIQ e LCD after activating the Touch Screen mode to avoid keyboard contamination of blood, chemicals, etc.

Touch Screen Display



Figure 7-1. Touch Screen Display Tour

- | | |
|---|--|
| 1. Patient, click to register patient | 9. Top Menu |
| 2. Preset, click to go into Preset Screen | 10. Freeze |
| 3. Comment, click to add comments | 11. P1, P3, click to store images |
| 4. Measure, click to start 2D measurement | 12. Power Output |
| 5. End Exam, click to end current exam and system will auto store images permanently. | 13. Focus Position Control |
| 6. B Pause, click to toggle between real time B-Mode with Doppler Mode (with audio) | 14. Depth Control |
| 7. Clear All, click to clear all the annotations and measurements. | 15. Frequency Control |
| 8. Mode Panel Bar, click to select mode. | 16. Gain Control, click fast forward to increase or fast backward to decrease gain by larger steps |
| | 17. Scroll Button, click to go to previous/next clipboard gallery |

Starting a New Patient

Press the **Patient** Touch Screen key, a patient ID will be auto generated, and begins a new exam.

Selecting an Application Preset and a Probe

Press the **Preset** Touch Screen key to display the Preset Screen on the monitor. Select the probe or application by pressing it.



Figure 7-2. Application Preset

Optimizing the Image

B-Mode

Intended Uses

B-Mode is intended to provide two-dimensional images and measurement capabilities concerning the anatomical structure of soft tissue.

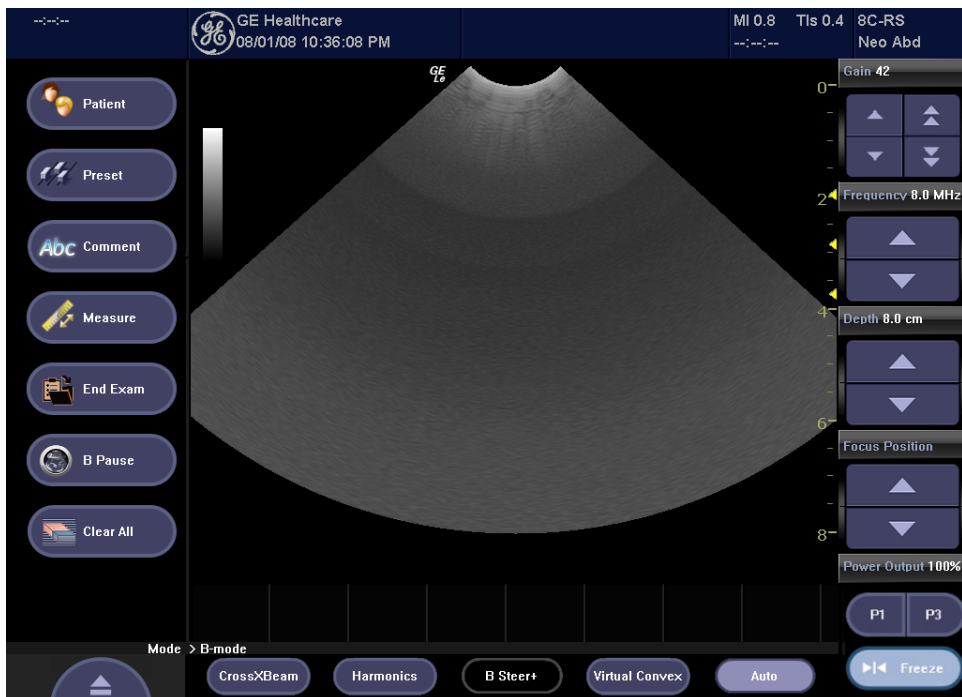


Figure 7-3. B-Mode Display

B-Mode Top Menu

Adjust the image by using the controls on the right. If additional functionality is needed, the following Top Menu controls are available.

See Chapter 5 for more details on these controls.



Figure 7-4. B-Mode Top Menu

M-Mode

Intended Uses

M-Mode is intended to provide a display format and measurement capability that represents tissue displacement (motion) occurring over time along a single vector.

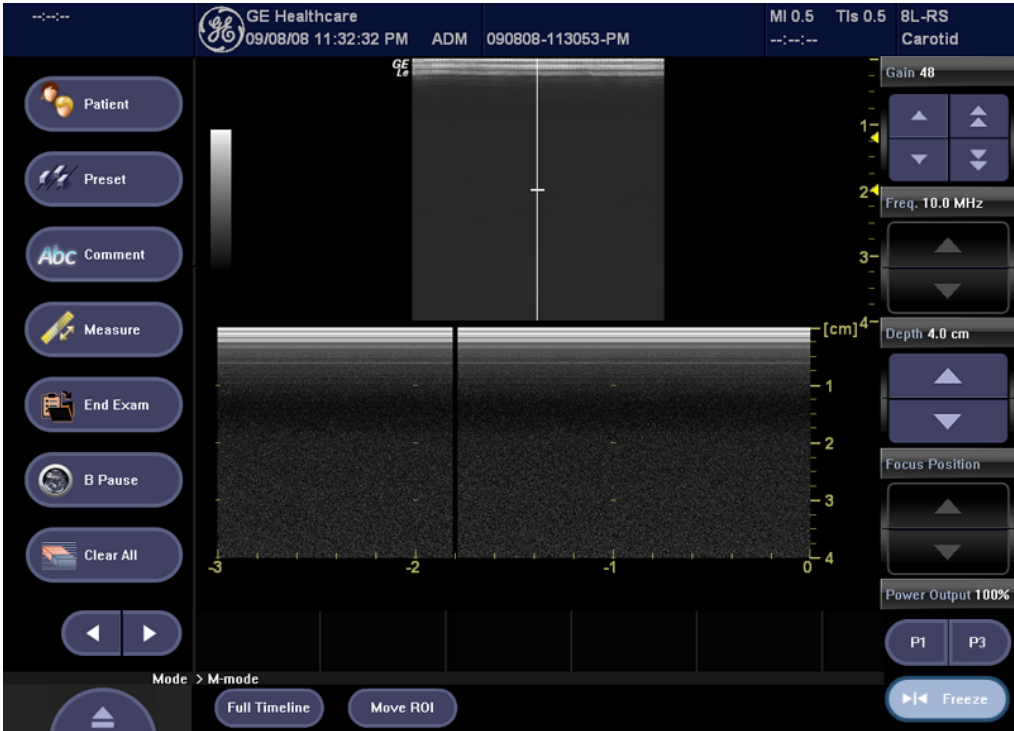


Figure 7-5. M-Mode Display

M-Mode Top Menu

The following Top Menu controls are available for functionality adjustment and image optimization.

See Chapter 5 for more details on these controls.



Figure 7-6. M-Mode Top Menu

Color Flow (CF) Mode

Intended Uses

Color Flow Mode is a Doppler Mode intended to add color-coded qualitative information concerning the relative velocity and direction of fluid motion within the B-Mode image.

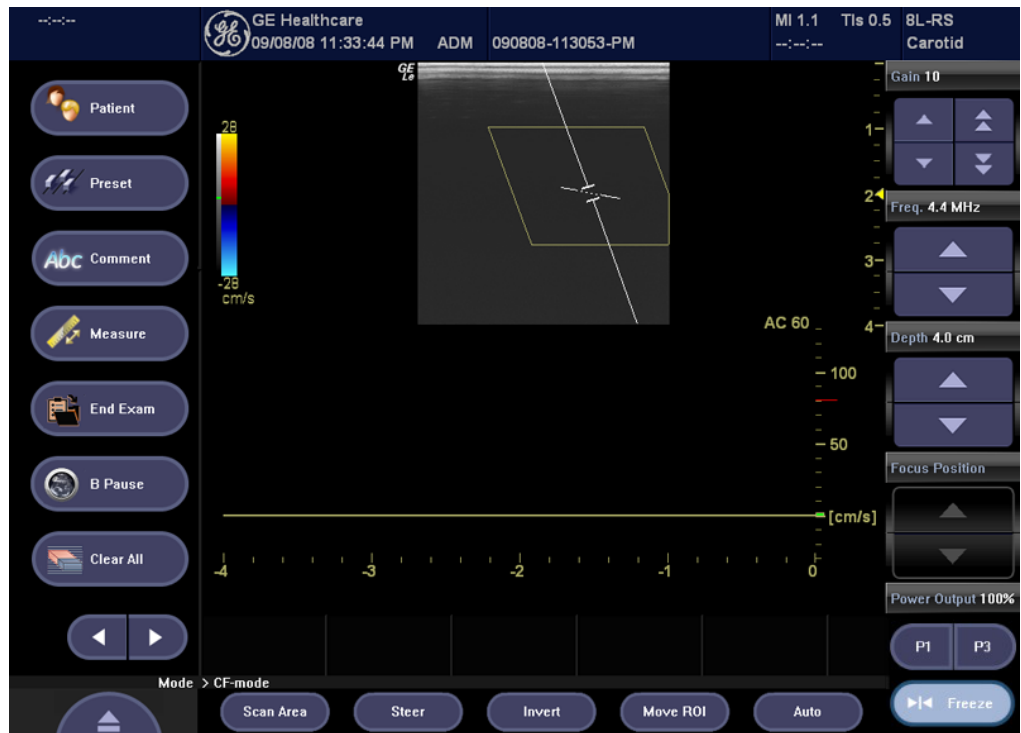


Figure 7-7. Color Flow Mode Display

CF-Mode Top Menu

The following Top Menu controls are available for functionality adjustment and image optimization.
See Chapter 5 for more details on these controls.



Figure 7-8. CF-Mode Top Menu

Power Doppler Imaging (PDI) Mode

Intended Uses

Power Doppler Imaging (PDI) is a color flow mapping technique used to map the strength of the Doppler signal coming from the flow rather than the frequency shift of the signal. Using this technique, the ultrasound system plots color flow based on the number of reflectors that are moving, regardless of their velocity. PDI does not map velocity, therefore it is not subject to aliasing.



Figure 7-9. Power Doppler Imaging Display

PDI Top Menu

The following Top Menu controls are available for functionality adjustment and image optimization.

See Chapter 5 for more details on these controls.



Figure 7-10. PDI Top Menu

Pulsed Wave (PW) Doppler Mode

Intended Uses

Doppler is intended to provide measurement data concerning the velocity of moving tissues and fluids. PW Doppler lets you examine blood flow data selectively from a small region called the sample volume.

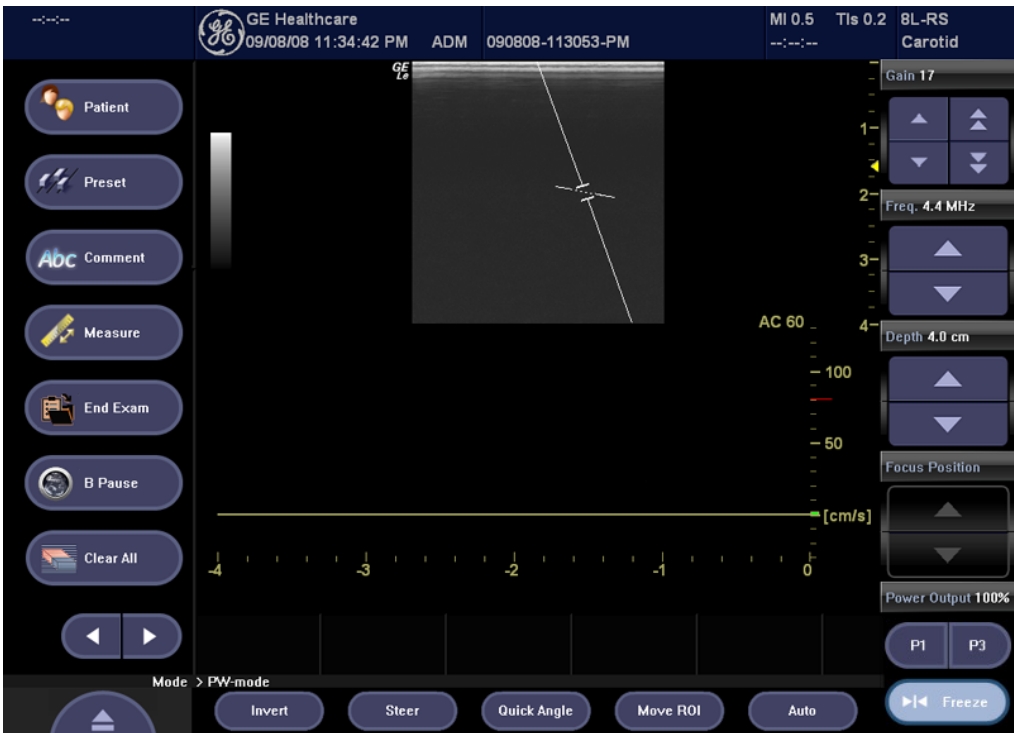


Figure 7-11. PW Doppler Mode Display

PW Doppler Mode Top Menu

The following Top Menu controls are available for functionality adjustment and image optimization.
See Chapter 5 for more details on these controls.



Figure 7-12. PW Doppler Mode Top Menu

Measurement

Introduction

Measurement supports 2D caliper only when operating in Touch Screen mode.

List of General Measurements

The following table shows the types of general measurements available when you select **Measure**.

Table 7-1: General Measurements by Mode

If you press <i>Measure</i> (while frozen)	Mode		
	B and CF	Doppler	M
Once	Distance	Velocity	Tissue Depth
Twice			Time interval
Three Times			Time and velocity

General Instructions

The general steps for perform a measurement is as follows:

- 1. Select the **Measure** Touch Screen key.
- 2. Click to place the first caliper .
- 3. Click to place the second caliper. The result displays in the Results Window.

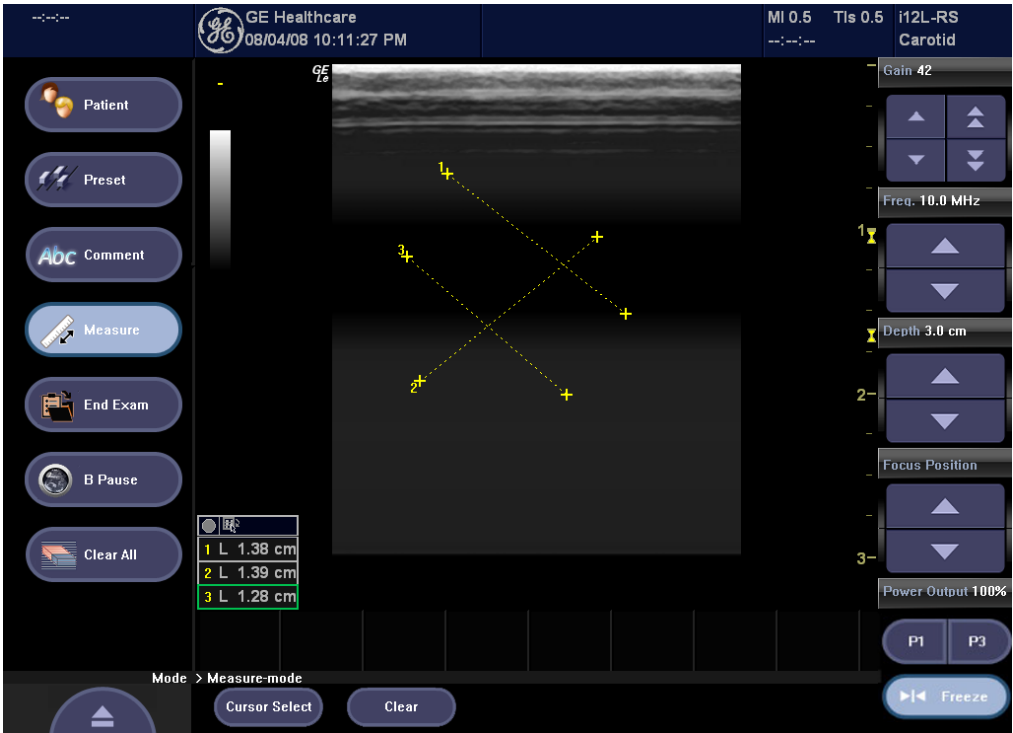


Figure 7-13. Measurement example



Figure 7-14. Measurement screen Top Menu

See Chapter 7 for more details of the Top Menu.

Comment

General Instructions

Clicking **Comment** initiates the comment mode. Select the comment in the list, place it by clicking the target position on the Touch Screen. Click **More** to select in other applications. Click **Edit** to reset cursor position.

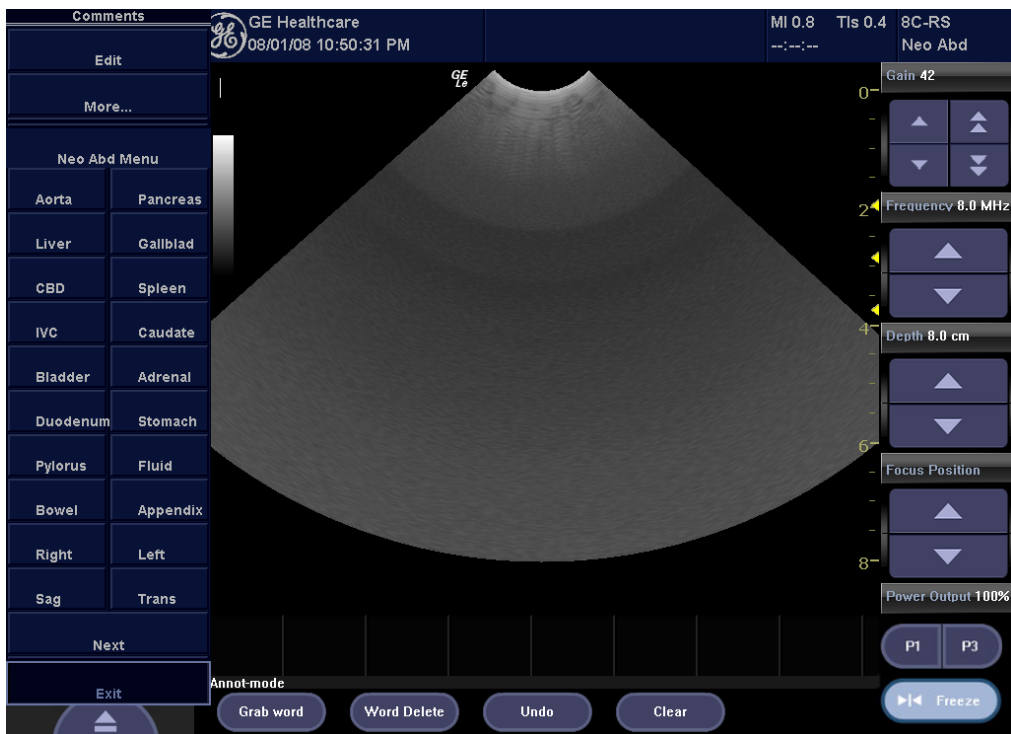


Figure 7-15. Comment Screen



Figure 7-16. Comment screen Top Menu

General Instructions (continued)

To reposition a comment,

1. Select **Grab Word** to select the comment
2. Select the target position on the Touch Screen to reposition.

See Chapter 6 for more details of the Top Menu

Using CINE

Introduction

CINE images are constantly being stored by the system and are available for playback or manual review via CINE.

Activate CINE

Select **Freeze** to freeze the image.

CINE mode monitor display

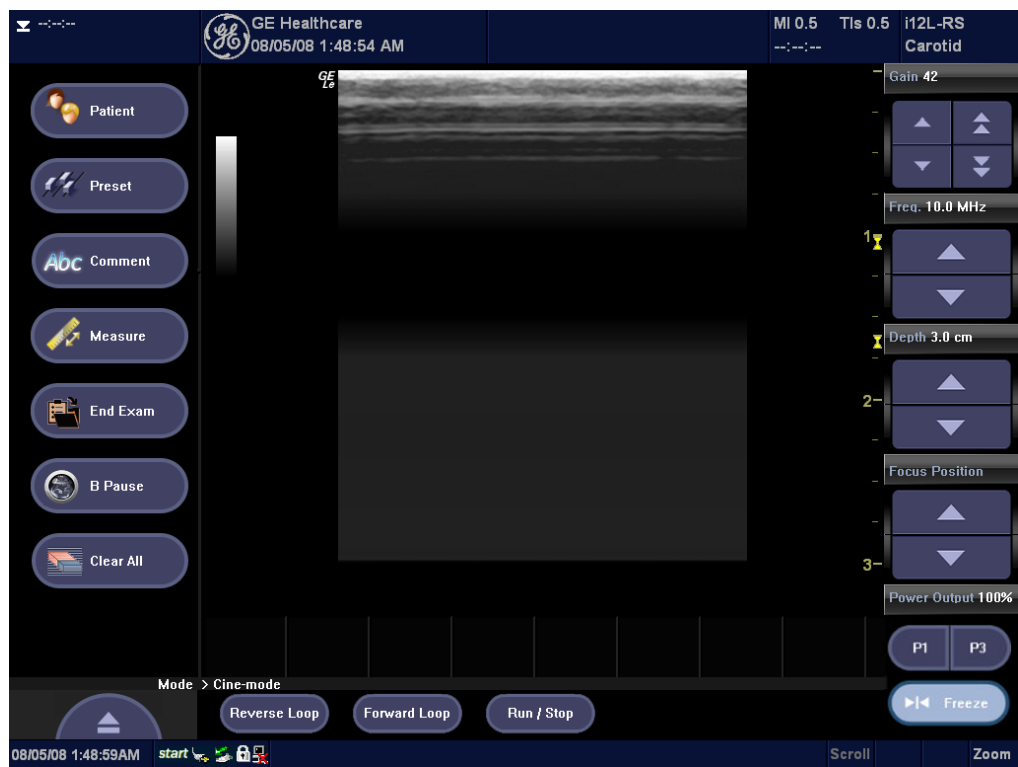


Figure 7-17. CINE mode monitor display

Select **Run** to go through the image loop. Select **Reverse Loop** to go backward frame by frame. Select **Forward Loop** to go forward frame by frame.

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